# THE IRON AGE

New York, Thursday, March 31, 1910.


# Foreign Opportunities for American Machine Tools.

## The Austro-Hungarian Market—Important Manufacturing Districts—Machinery Building—Locomotives.

BY CAPT. GODFREY L. CARDEN.

The importance of the Austro-Hungarian market for American machine tools is emphasized by Captain Carden of the United States Revenue Cutter Service as a result of his investigation abroad as a special agent for the Department of Commerce and Labor. He recently completed nearly 10 years of inspection work among the leading manufacturing plants of Europe, and his reports were published in the *Daily Consular and Trade Reports*. His views on the situation are based upon personal knowledge of conditions as they exist.

The Austria-Hungary territory offers one of the best fields abroad to-day for the exploitation of American machine tools. During 1908 the Austria-Hungary market imported machine tools from Germany aggregating over 10,000 tons weight, which was an increase of 41 per cent. over the figures for 1907. In 1908 the German exports to Italy and France were less than in 1907, and in 1907 Italy imported more machine tools from Germany than did Austria-Hungary.

There is probably no part of Europe less known and understood by American manufacturers than the Austria-Hungary empire. In this great territory no fewer than 20 different languages are employed in every-day life, and the monarchy comprises 17 crown lands. The information relative to this country has largely come from foreign sources and the viewpoint has generally been a foreign one.

The writer has visited during the past two years a majority of the important manufacturing centers of Europe and feels warranted in asserting that the Austria-Hungary market calls for the closest attention on the part of American manufacturers of machine tools. There is not only a demand for high grade tools there, but this demand is increasing. The standard of work, as evidenced among the majority of the Austrian plants, is exceptionally high, and for the production of much of these Austrian outputs there are required machine tools of the highest accuracy.

### American Tools Held in High Regard.

The question of price is not all-determining with the directors of Austrian and Hungarian works. While they are good business men, price alone does not control their decisions. At the works of the Bohemia-Moravia Company in Prague, I asked the engineer in charge of the machinery department for his general views regarding American made tools, and his reply was that they were easily first. He declared it as his opinion that the time would not come when American machine tools, generally speaking, would be equaled by Continental makes. In this plant I found about 520 machine tools in service, and of this number fully 100 are of American origin.

In the Floridsdorf Locomotive Works, located on the outskirts of Vienna, I found a new American made vertical milling machine (No. 4 size), which had been installed only a few days prior to my inspection. The price paid for this tool was $2436. Close beside it was a Reinecker tool from the Chemnitz shops of Germany, of practically the same size and type. The price paid for the Reinecker machine was $1583. The latter tool had been in service six months, but the Floridsdorf shops wanted a stronger tool, and the American machine was purchased, notwithstanding the difference in price, because, in the opinion of the Floridsdorf management, the latter more fully met their requirements.

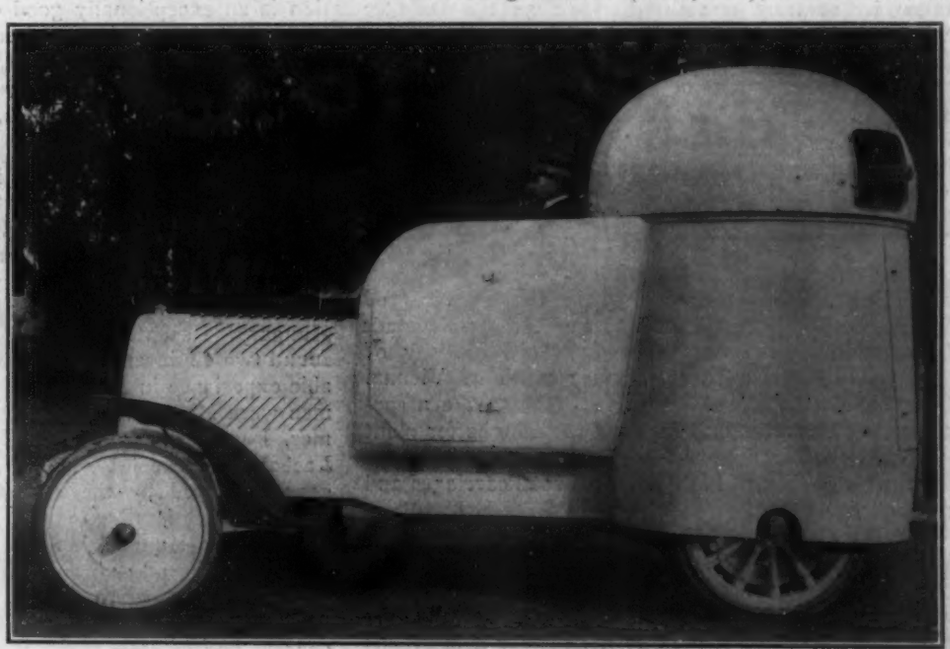


Fig. 1.—An Armored Car Built by the Daimler Works, Wiener-Neustadt, Austria.

At the Ringhoffer Works, one of the best of the Prague plants, the statement was made by the shop-master that his best tools were of American origin. The writer could quote similar opinions from many works in this territory. These are not new statements, or new facts, since they have repeatedly been made by me in reports from abroad. They are reiterated to emphasize the assertion made at the outset that the Austria-Hungary field offers every inducement to American machine tool makers.

Fig. 2.—Heavy Gun Transport Wagons, Built by the Daimler Works, Wiener-Neustadt, Austria.

**Classes of Products Manufactured.**

The general manufacturing work carried on in both Austria and Hungary deals largely with the building of locomotives, steam engines of all descriptions, gas engines, turbines, railroad equipment, bridge building, ice manufacturing plants, water works plants, cranes, lifts, conveyers, steam, hydraulic and pneumatic presses, pumps, complete equipment for sugar factories and refineries, breweries, and starch and yeast factories, steam generators, sawmill machinery, equipment for cement making machinery, flour mills, &c. The manufacture of automobiles is extensively undertaken by at least one firm, known as the Daimler Works, located at Wiener-Neustadt. Fig. 1 shows an armored car built at these works and Fig. 2 heavy transport wagons used to transport heavy siege guns and siege material. The latter are designed to climb heavy grades. Each is fitted with a windlass for pulling its load aboard or itself up very steep inclines.

Most of the locomotive construction in Austria is in close proximity to or in Vienna. In Vienna proper there are the locomotive shops of the Privileged Austro-Hungarian State Railway Works. The Florisdorf Locomotive Shops are situated in the outskirts of Vienna, and the plant known as the Wiener-Neustadt Locomotive Works are to be found in the city of Wiener-Neustadt, a short distance south of Vienna. In Prague the Bohemia-Moravia Works make a specialty of locomotive building, and the Ringhoffer plant is one of the best known establishments in all Europe for the production of high grade railroad carriages and railroad equipment.

The locomotives built by the Bohemia-Moravia Works are of the Gölsdorf design, Fig. 3, with four-cylinder compound engine and generally similar to what is known in the United States as the Atlantic type. The first engine built by the Prague firm of this type developed a speed of 87 miles per hour. As a rule these engines are worked at from 175 to 220 lb. pressure.

**Bohemian Industries.**

The Bohemian territory is the most important in the Austrian field. Prague can boast of a greater number of manufacturing plants of importance than probably any other district in the empire. In Pilsen, distant not far from Prague, is located the great Skoda Works. Skoda is to Austria what Krupp is to Germany, Le Creusôt to France and Cockerill to Belgium. Skoda undertakes to produce practically all the artillery requirements for the Austrian army and navy. There is this essential difference, however; that the Skoda plant confines attention largely to the machining work. The heavy forgings, and, for that matter, the greater part of the steel employed, is supplied by Witkowitz. This last named establishment is located in Moravia and is one of the most extraordinarily interesting of all the great works in Austria. Witkowitz is employing at present about 28,000 men, and the machine tool installation is an exceptionally good one. Probably no plant in the Austrian empire requires a higher grade of tools than the Skoda Works.

**Hungarian Prospects.**

In Hungary the possibilities for the sale of American machine tools are especially attractive. The manufacturing center of Hungary is Budapest. There are a number of plants lying outside of the Hungarian capital, but, broadly speaking, the more important of the Hungarian works are in the city of Budapest proper. A marked exception is the great Resicza plant, located in the mountain fastness of southeastern Hungary. I spent two days at the Resicza Works, and found two engineers there who had had long and valuable experience in American shops. These two gentlemen were Moritz Weiss and Alexander Lám; the former, I understand, came to Resicza direct from the Lackawanna Steel Works. The total force in Hungary employed by the company which controls the Resicza plant is 18,000 men. This firm is the Privileged Austro-Hungarian State Railway Company. The actual number of men engaged at Resicza is approximately 6000. Near to Resicza are important works at Aninà and Roman-Bogsan. Resicza is turning out a general line of steel work, and there is a department devoted to the manufacture of field artillery and gun shields. The requirements in the artillery department call for the very best grades of accurately working machine tools.

In Budapest are located the Ganz Electrical Works, the Láng Steam Engine Building Shops and the Budapest Locomotive Works. There is so much that might be said with reference to Ganz that I feel the subject should be left to separate discussion. Ganz is not

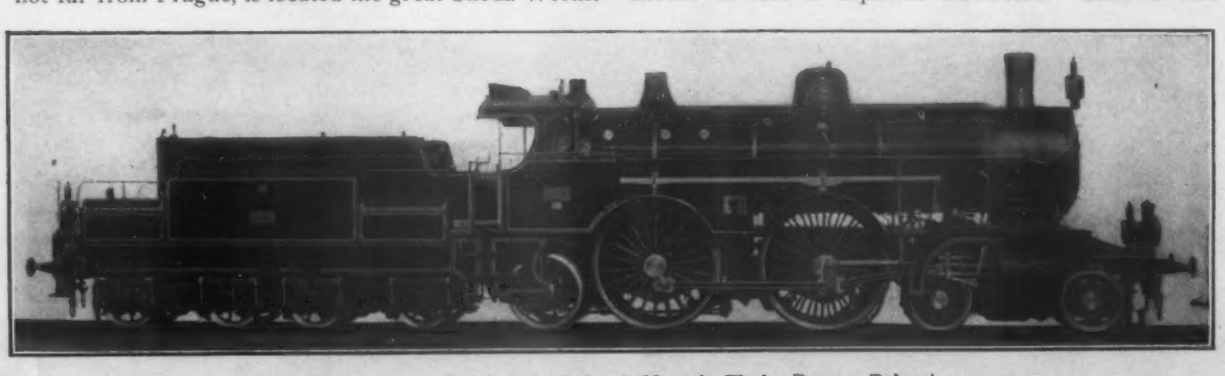


Fig. 3.—Locomotive Built at the Bohemia-Moravia Works, Prague, Bohemia.

merely a manufacturing plant; it is a laboratory of most distinguished character, and from the Ganz offices have emanated much that is representative of the superlative in the world to-day in electrical development. When I visited the Ganz shops they were increasing the output facilities and there was a demand for high grade machine tools. At the Láng Works there are produced to-day steam engines of remarkably fine finish and design. In the assembling department here I again found an engineer who had received training in the United States, and wherever abroad I have met a shop official possessing American training I found a demand for American machine tools.

The Budapest locomotive shops are undertaking to build the Atlantic and Prairie types of locomotives of American design, but I am bound to say that the Budapest shops are turning out these American type locomotives with the highest regard to economy of operation and finish. The writer has visited practically all of the leading locomotive plants on the continent of Europe, and it is his opinion that the Budapest shops are turning out work which will closely approximate to the best seen abroad. The locomotive shown in Fig. 4 is of the type III's.

The Budapest shops, and especially the locomotive works, are making constant additions to the machine and tool equipment. There are comparatively few American machine tools reaching this locomotive plant. At the same time it was noticeable that the English firm of Alfred Herbert, Ltd., is supplying tools in substantial numbers. Herbert may be regarded as a real competitor abroad of American machine tool makers, but the competition is of a clean, straightforward character. Herbert is the one English works which is reaching the general European market. There are several English firms which are doing an excellent business in France, but at the present writing Herbert appears to be the only firm in the United Kingdom that has measured up to the entire European field.

Locomotive construction has been for many years a prominent manufacturing feature in Austria. In Hungary it is of more recent origin. Early in the history of locomotive building of the last century Austrian engineers were prominent in the designing rooms of various European plants, and to-day there is probably no more distinguished engineer in the locomotive field than the Austrian engineer Charles Gölsdorf. This gentleman is attached to the Austrian State Railway Government staff.

### Little Machine Tool Building.

The manufacture of machine tools in Austria-Hungary is very limited. The principal output is from the Vulcan Works, located in Vienna. This plant has a branch in Budapest; the tools built by Vulcan are of the heavier sizes and no attempt is made to produce series work. There are a number of small plants which manufacture medium sized tools, and noteworthy in the list are the Ernst Dania Works and the Joh. Müller Shops. The Dania Works do not attempt to specialize. This plant will undertake to build to order any one of nearly 200 varieties of tools. The only attempt at building in series is in connection with lathes, drills, planers and shapers. These tools are turned out in lots of either 6 or 12, according to size. Dania employs about 200 men.

The Müller Works are now employing about 75 men, though I understand when times are good the force is increased to as many as 250. This plant is endeavoring to make a specialty of lathes and is building the ordinary engine type. Aside from lathes, the Müller Shops undertake to build about 15 different types of tools.

### The Particular Need.

It is the writer's observation that Austrian works do not offer to-day in sufficient quantities medium sized tools of the highest grade, and it is in this particular field that American manufacturers will find a situation to warrant attention. The Austrian territory is as accessible to American machine tools, so far as transportation is concerned, as San Francisco is in the matter of making shipments from New York. It will probably be found that the transportation rates to points in Austria are more advantageous than many of the transcontinental rates in this country. The economic and political conditions in Austria-Hungary are all favorable to American importations, and an American representative will find that he enjoys a freedom from the prejudices which exist toward many foreigners.

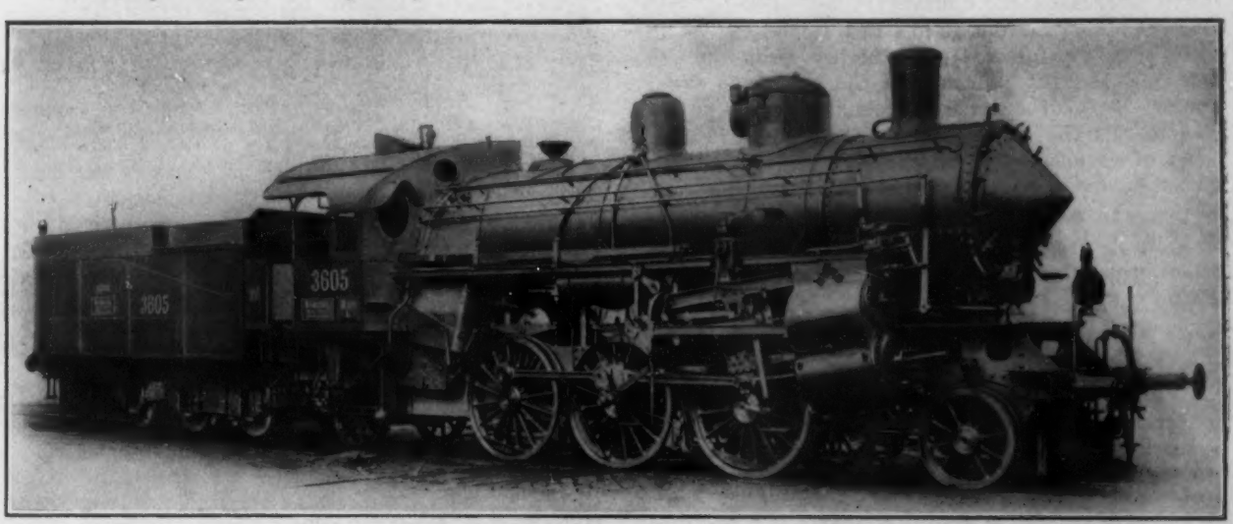



Fig. 4.—A Type III's Locomotive Built by the Budapest Locomotive Works for High Speed Freight and Passenger Service.

The general impression that German exports control the Austrian territory is not true at the present time. It may have held good in previous years, but where high grade American machine tools are available the Austrian manufacturers may be depended upon to purchase on the merits of the machine. The Austrian Government regulations require that the preference shall be given on Government work to Austrian material when possible, but it is recognized in high official quarters that the best grades of machine tools are not always obtainable in Austria and that in such cases foreign equipment must be secured. In such circumstances there is every reason to believe that American machine tools will be given the first consideration if properly introduced. It is the writer's opinion that trade with foreign states should be treated in the same light as interstate trade at home. When this view is taken of the situation there will be an increased foreign business. The first consideration requires that Americans be introduced with their products.

# The Hardness of Quenched Steels.

## With Particular Reference to Quenched Case Hardened Steels.

In the *Revue de Metallurgie* for January, 1910, is a very interesting and important paper by MM. Portevin and Berjot. The full title is "Experiments on the Hardness of Quenched Steels, and Particularly on the Hardness of Case Hardened and Quenched Steels." It is of importance to all users of quenched steels, and especially to builders of automobiles using so many case hardened parts. The methods of testing the hardness were the Brinell ball test, using a ball of 10 mm. diameter and 3000 kg. pressure, also the Shore scleroscope, using a hardened steel hammer.

In using the scleroscope the size of the test piece has an influence on the result. This is obviated by using throughout cylinders 22 mm. diameter and 20 mm. high (0.87 in. diameter and 0.79 in. high). The hardness was measured on the carefully polished faces of the cylinder, for the preparation of the surface also has an effect on the results. No trustworthy results can be obtained on steel quenched from too high a temperature, for many small cracks are formed and results on the same piece may vary within wide limits. One sample gave from 20 to 60; a second test on the same place also gives a much higher result than the first one, and the influence of the superficial decarburized layer of quenched steels is very great. To obviate this the heatings were carried out in fused baths of various salts and the pieces supported in a special holder of perforated thin sheet iron.

### Hardness of Quenched and Reheated Steels.

With due regard to the precautions outlined above experiments were carried out on three steels of the following composition:

| | Carbon. | Phosphorus. | Manganese. | Silicon. |
|---|---|---|---|---|
| Silicon gear steel | 0.56 | trace | 0.28 | 1.46 |
| Medium steel | 0.32 | 0.09 | 0.64 | 0.03 |
| Hard steel | 1.46 | 0.02 | 0.28 | 0.10 |

With the first steel the hardness was measured with both machines, and these carefully carried out comparative results are therefore of great value. They are given in Table I. The steel was quenched in oil from 850 degrees C. (1560 degrees F.).

Shore reading before 40, after 71.

Brincll reading before 250, after 537.

*Table I.—Silicon Steel.*

| Reheating temperature. Deg. C. | Time of reheating. Min. | Shore reading. | Brinell reading. | Per cent. loss of increase of hardness due to quenching. Shore. | Brinell. |
|---|---|---|---|---|---|
| 200 | 15 | 71 | 537 | 0.0 | 0.0 |
| | 30 | 71 | 537 | 0.0 | 0.0 |
| | 60 | 71 | 520 | 0.0 | 5.9 |
| 300 | 15 | 68 | 495 | 9.6 | 14.6 |
| | 30 | 66 | 480 | 16.1 | 19.8 |
| | 60 | 64 | 445 | 22.5 | 32.0 |
| 400 | 15 | 63 | 433 | 25.8 | 36.2 |
| | 30 | 63 | 420 | 25.8 | 40.7 |
| | 60 | 61 | 403 | 32.2 | 46.6 |
| 500 | 15 | 58 | 362 | 41.9 | 60.9 |
| | 30 | 56 | 349 | 48.3 | 65.5 |
| | 60 | 55 | 319 | 51.6 | 75.9 |
| 600 | 15 | 48 | 309 | 77.4 | 79.4 |
| | 30 | 44 | 280 | 87.0 | 86.4 |
| | 60 | 41 | 262 | 96.7 | 95.8 |

In Tables II and III are given the results with the Shore machine alone on the medium and hard steels.

*Table II.—Medium Steel.*

Quenched in water from 750 degrees C. (1380 degrees F.).

| Reading before quenching. | Reading after quenching. | Reheating temperature Deg. C. | Time of reheating. | Reading. | Per cent. loss of increase from quenching. |
|---|---|---|---|---|---|
| 23 | 61 | 200 | 15 | 61.0 | 0.0 |
| 23 | 62 | | 30 | 62.0 | 0.0 |
| 22 | 62 | | 60 | 61.5 | 1.2 |
| 23 | 62 | 250 | 15 | 61.0 | 1.2 |
| 22 | 62 | | 30 | 61.5 | 2.5 |
| 23 | 61 | | 60 | 59.5 | 3.9 |
| 23 | 62 | 300 | 15 | 58 | 10.2 |
| 22 | 61 | | 30 | 55 | 15.3 |
| 22 | 62 | | 60 | 55 | 17.5 |
| 22 | 62 | 350 | 15 | 55 | 17.5 |
| 22 | 62 | | 30 | 54 | 20.0 |
| 23 | 61 | | 60 | 51 | 26.3 |
| 22 | 62 | 400 | 15 | 48 | 35.0 |
| 23 | 62 | | 30 | 47 | 38.4 |
| 22 | 62 | | 60 | 44 | 45.0 |
| 22 | 63 | 450 | 15 | 37 | 63.4 |
| 22 | 63 | | 30 | 34 | 70.7 |
| 23 | 62 | | 60 | 32 | 76.9 |
| 22 | 63 | 500 | 15 | 29 | 82.9 |
| 22 | 63 | | 30 | 26 | 90.0 |
| 23 | 62 | | 60 | 25 | 92.5 |

*Table III.—Hard Steel.*

Quenching in water from 750 degrees C. (1380 degrees F.).

| Reading before quenching. | Reading after quenching. | Reheating temperature Deg. C. | Time of reheating. | Reading. | Per cent. loss of increase from quenching. |
|---|---|---|---|---|---|
| 33 | 83 | 200 | 15 | 83 | 0.0 |
| 33 | 83 | | 30 | 83 | 0.0 |
| 32 | 82 | | 60 | 82 | 0.0 |
| 33 | 82 | 250 | 15 | 82 | 0.0 |
| 32 | 83 | | 30 | 82 | 1.9 |
| 32 | 83 | | 60 | 81.5 | 2.9 |
| 32 | 83 | 300 | 15 | 80 | 5.8 |
| 33 | 83 | | 30 | 79 | 8.0 |
| 33 | 82 | | 60 | 76.5 | 11.2 |
| 33 | 82 | 350 | 15 | 76.5 | 11.2 |
| 33 | 83 | | 30 | 75 | 16.0 |
| 32 | 83 | | 60 | 73.5 | 18.6 |
| 33 | 82 | 400 | 15 | 66 | 32.6 |
| 33 | 82 | | 30 | 64.5 | 35.7 |
| 33 | 83 | | 60 | 62 | 42.0 |
| 33 | 83 | 450 | 15 | 56 | 52.0 |
| 33 | 83 | | 30 | 52 | 62.0 |
| 33 | 83 | | 60 | 51 | 64.0 |
| 32 | 83 | 500 | 15 | 42 | 80.3 |
| 33 | 83 | | 30 | 39 | 88.0 |
| 33 | 83 | | 60 | 36 | 96.0 |

The results in the last columns of Tables II and III make most interesting curves. It is seen that a tempering of 15 min. at higher temperaturs equals one of 30 min. or 60 min. at lower temperatures.

### Experiments with Case Hardened Steels.

It seemed possible that the Shore machine would measure accurately the hardness of the surface of the case hardened steels, while the Brinell test, which made a deeper print, would give indications as to the thickness of the case. The steels used were of the following compositions:

| | Car. | Phos. | Man. | Sil. | Ni. |
|---|---|---|---|---|---|
| Ordinary steel | 0.13 | 0.01 | 0.37 | 0.03 | ... |
| Nickel steel | 0.09 | trace | 0.33 | 0.03 | 2.54 |

The case hardening mixture used was 60 per cent. wood charcoal and 40 per cent. barium carbonate, the cylinders of steel being packed in this concentrically in cylindrical boxes 90 mm. diameter. The thickness of the case was determined by the microscope: First, the total thickness, then that of the layer containing free cementite and also that of the layer of compact pearlite. In the following table are given the results on pieces of the nickel steel heated to 1000 degrees C. in the cementing mixture and hardened in water from 700 degrees C.:

*Table IV.—Nickel Steel.*

| Time of case hardening. Hours. | By microscope. Total thickness. Inch. | Pearlite. Inch. | Thickness of layer with Cementite. Inch. | Hardness. Shore. | Brinell. |
|---|---|---|---|---|---|
| 1 | 0.008 | .... | .... | 46 | 147 |
| 2 | 0.024 | 0.016 | .... | 89 | 334 |
| 3 | 0.040 | 0.025 | 0.012 | 91 | 418 |
| 4 | 0.056 | 0.033 | 0.019 | 89 | 419 |
| 6 | 0.073 | 0.040 | 0.021 | 88 | 488 |
| 9 | 0.108 | 0.059 | 0.028 | 89 | 610 |

The carbon in the skin of the first sample was about 0.50 per cent. It is evident from the results that the Shore readings give the hardness of the extreme outer surface, for they are practically uniform with the exception of the first one, while the Brinell results depend also on the thickness of the case.

Experiments were also done on the nickel steel to determine the influence of the quenching temperature. The little cylinders had been case hardened for six hours.

*Table V.—Effect of Quenching Temperature.*

| Shore reading before quenching. | Quenching temperature. Degrees C. | Shore reading after quenching. | Brinell reading. |
|---|---|---|---|
| 46 | 1100 | 82 | 632 |
| 45 | 1000 | 83 | 600 |
| 45 | 900 | 80 | 578 |
| 45 | 800 | 83 | 532 |
| 45 | 750 | 86.5 | 550 |
| 45 | 700 | 91 | 480 |
| 45 | 685 | 49 | ... |
| 45 | 665 | 45 | 217 |
| 45 | 650 | 45 | 222 |
| 44.5 | 600 | 45 | 214 |

The Shore results when plotted show that the greatest hardness is obtained with a quenching temperature of 700 degrees C. Similar experiments with the ordinary steel give the best temperature as 725 degrees C.

Not to go into too great detail, it may be said that experiments were carried out on reheating the quenched case hardened pieces, on measuring the thickness of the case and on the effect of annealing the case hardened cylinders. For annealing they were packed in

turnings of gray cast iron, which effectually prevented any decarburization.

**Conclusions.**

The following conclusions are permissible:

1. With the precautions given, the Shore instrument may be used to determine the hardness of quenched steels.

2. With case hardened steels it gives the superficial hardness of the case and does not appear to be influenced by its thickness after the carbon has reached about 0.8 per cent.

3. The Brinell test depends both on the superficial hardness and the depth of the case.

4. Employing both methods of examination it is possible to determine the heat treatment and the thickness of the case.

5. The Shore instrument enables one to determine the best reheating or tempering temperature for quenched steels.

6. In case hardened steels the maximum hardness is obtained by quenching at 725 degrees C. for ordinary steels and 700 degrees C. for nickel steels with about 2.5 per cent. nickel.

7. A suitable annealing makes the cementite of a case hardened steel disappear completely by diffusion. It is also possible to transform the abrupt case given by cyanides to the gradual one so desired.

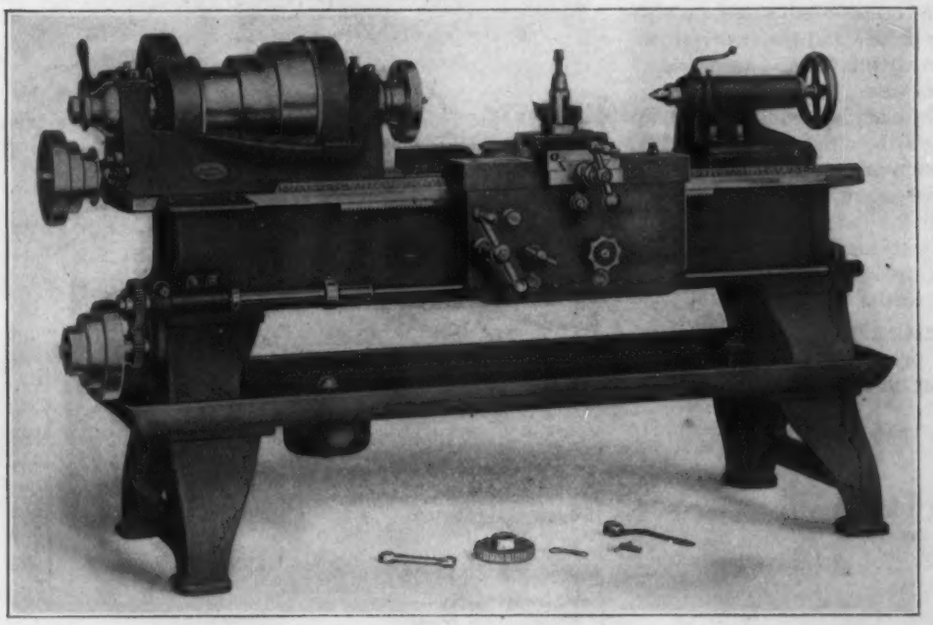
G. B. W.

**Steel Plate Drawback.**—The Treasury Department has advised the collector of customs at Philadelphia that the Department's regulations of February 10, 1909 (T. D. 29,552), providing for the allowance of drawback on pig iron, steel ingots, blooms, plates, structural material, &c., manufactured by the Bethlehem Steel Company, South Bethlehem, Pa., from imported iron ore, ferromanganese and ferrosilicon by the open hearth process, are extended, so far as applicable, to cover the exportation of plates manufactured by the Lukens Iron & Steel Company, Coatesville, Pa., from imported scrap steel in combination with domestic pig iron. In liquidation, there shall be taken as the basis for the allowance of drawback 1.089 tons of material for each ton of finished product. The quantity of imported scrap upon which drawback shall be allowed shall be ascertained by taking the proper percentage of 1.089 for each ton of exported product according to the proportion of imported scrap used in the mixture, as shown by the sworn abstract from the special manufacturing record.

## The Reed Extra Heavy 14-In. Plain Turning Lathe.

The 14-in. heavy plain turning lathe illustrated is designed by its builder, the F. E. Reed Company, Worcester, Mass., for the rapid production of vanadium and other special steel parts largely used in the automobile, motor boat, engine and kindred industries. Its construction is of the heaviest throughout, with power and stiffness equal to that of an ordinary 20-in. lathe.

The head spindle is a crucible steel forging, with a 1⅛-in. hole through it. The cone, for a 3¼-in. belt, has steps of 7½, 9¾ and 12 in. in diameter, and the back gears are correspondingly large and wide of face. The ratio is 3.62 to 1, affording a range of spindle speeds adapted to the class of work to be done. The spindle boxes are cast iron, lined with babbitt, firmly seated in dovetail slots. The front bearing is 2¾ in. in diameter and 6⅝ in. long. The tailstock is of the heavy cut-away pattern, with two large bolts for clamping it to the bed, and can be set over for turning tapers. The spindle bearing is 2⅜ in. in diameter and 8 in. long.



The New Extra Heavy 14-In. Lathe Built by the F. E. Reed Company, Worcester, Mass.

The lathe has a special heavy plain rest, with wide and deep dovetail slide. It rests its entire length on the vees and is gibbed to both inside and outside of the bed. There are power cross and longitudinal feeds, each with independent friction and automatic stop. The feed cones are large and carry 1¼-in. belt, which in connection with the worm and worm gear in the apron affords ample power for the heaviest cuts. The machine is regularly built without a lead screw, but one can be furnished. The lathe is mounted on the ordinary legs, or in a steel oil pan with special upper and lower legs, as shown in the illustration. The countershaft has one friction pulley, 14 in. in diameter, for 3¾-in. belt, and should run at 200 rev. per min. The swing over the bed is 16⅝ in. and over the plain rest 8½ in. Other specifications for different lengths of bed follow:

| Length of bed. Feet. | Distance between centers.—Feet and Inches. | | Floor space over all. Feet and inches. | Net weight. Pounds. | Weight of pan Pounds. |
|---|---|---|---|---|---|
| 5 | 1 | 2 | 6 2 x 3 | 2,050 | 300 |
| 6 | 2 | 2 | 7 2 x 3 | 2,200 | 335 |
| 7 | 3 | 2 | 8 2 x 3 | 2,350 | 375 |
| 8 | 4 | 2 | 9 2 x 3 | 2,500 | 410 |
| 9 | 5 | 2 | 10 2 x 3 | 2,700 | 450 |
| 10 | 6 | 2 | 11 2 x 3 | 2,900 | 485 |

The annual meeting of the Temple Iron Company was held at Reading, Pa., March 19. The following directors were elected: George F. Baer and Joseph S. Harris, Philadelphia & Reading Railway; W. H. Truesdale, Delaware, Lackawanna & Western Railroad; E. R. Thomas, Lehigh Valley Railroad; F. C. Smink, Reading Iron Company; Thomas P. Fowler, New York, Ontario & Western Railway; F. D. Underwood, Erie Railroad; Albert Broden, Reading Iron Company; W. J. Richards, Reading Coal & Iron Company. George F. Baer was re-elected president, while A. F. Law of Scranton, Pa., was re-elected vice-president. The office of secretary-treasurer has not yet been filled.

# A New Le Blond Lathe.

## A Duplicate Part Manufacturing Lathe and a Standard Engine Lathe in One.

Experience had with power transmission systems in motor vehicles and the like has been of interest to lathe manufacturers and suggested a number of excellent features that they have applied with success. The accompanying engravings illustrate a new manufacturing lathe just placed on the market by the R. K. Le Blond Machine Tool Company, Cincinnati, Ohio. The new tool is a modification of the heavy duty engine lathe brought out by this concern and described in *The Iron Age* September 2, 1909. It is claimed to be the simplest and most durable geared head lathe. Special attention is called to the fact that the changes are all made with sliding gears and the drive is in every case made in straight lines.

The machine is equipped with multiple automatic length stops and multiple cross feed stops, which, coupled with great driving power and general rigidity, adapt it to the duplication of shafts and other work having one or more shoulders. The manufacturers claim that not only will this machine produce a greater output on this class of work than the special types of lathes brought out in recent years, but that it has the additional advantage of the standard lathe construction, adapting it to all other kinds of lathe work. Fig. 1 shows the machine in the 21-in. size, fitted with pan bed, pump, plain rest and plain geared feed. The machine is also supplied with screw cutting quick change gear mechanism and three-step cone double friction back gear, as in the case of the heavy duty tool previously described. The machines are built in 17, 19, 21, 25, 27, 30 and 33 in. swings.

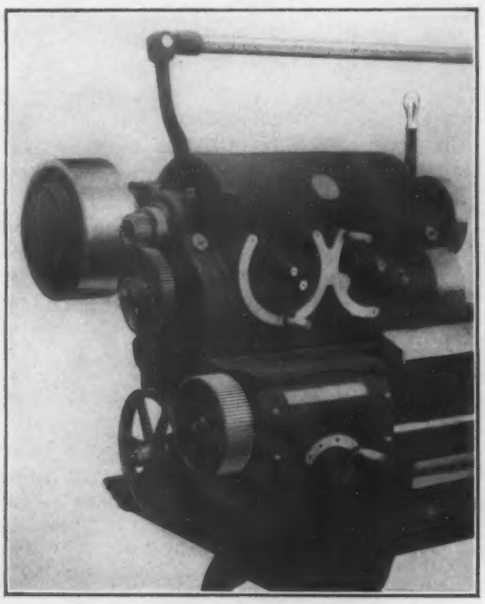


Fig. 2.—Exterior View of the Headstock with Gear Covers Removed.

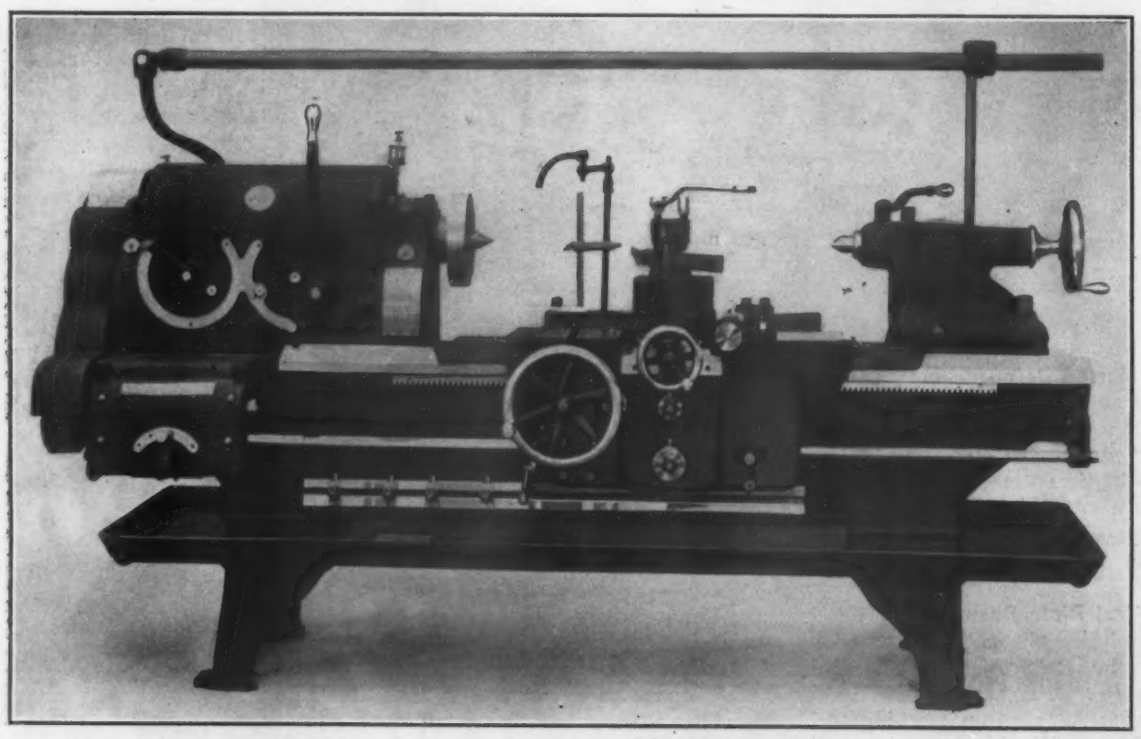


Fig. 1.—A 21-In. Lathe of the New Pattern Built by the R. K. Le Blond Machine Tool Company, Cincinnati, Ohio.

The headstock, shown in Figs. 2 and 3, is of closed box construction braced with cross ribs forming a reservoir, allowing the gearing to run in a bath of oil, increasing its efficiency and reducing wear to a minimum. Oil gauges are provided for showing the hight of the oil in the case. The spindle speeds are 12 in number, obtained with a single speed driving pulley, covering a carefully selected range, permitting the machine to be driven direct from the line shaft. The driving mechanism consists essentially of two shafts, the spindle and two sets of sliding gears, with a back gear of the design usually found on a friction head lathe. The driving pulley is equipped with a friction clutch of large diameter operated by a shifter bar extending lengthwise of the bed. This clutch is used for starting and stopping the lathe and permits driving direct from the line shaft.

A friction brake is operated by the same movement that disconnects this friction, so that the machine stops quickly and that element of wasted time is eliminated. The initial drive is through two sliding gears on the first driving shaft, either of which may be meshed with two gears keyed to a sleeve on the intermediate shaft. Three sliding gears are mounted on this sleeve which may be alternately meshed with three gears keyed to a sleeve mounted loosely on the spindle. This sleeve may be connected directly to the spindle by the friction side of the double end clutch, or through the back gears by engaging the toothed clutch with the clutch in the face gear. Care is exercised in the selection of material for gears; in no case are two soft steel gears brought into contact. The sliding gears have their teeth

rounded at the ends so as to facilitate their engagement and reduce chance of breaking. The three operating levers are conveniently placed on the front of the head and are so arranged that conflicting ratios cannot be engaged.

The heavy spindle is made from a high carbon hammered steel forging, finished by grinding to accurately standard size. The center and bush are fitted by grinding and all spindles are rigidly inspected for accuracy. The front spindle bearing is hardened and ground and

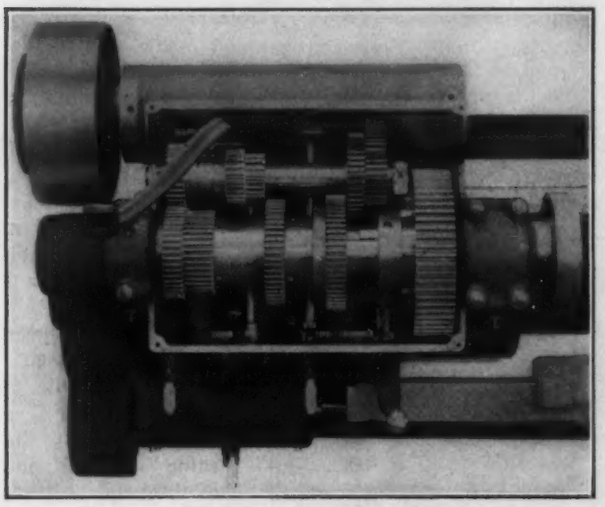


Fig. 3.—Birdseye View of the Headstock Opened.

runs in a special close grained cast iron box. This rather expensive piece of construction was determined on to insure a bearing able to stand the severe strains imposed when operating a lathe at the maximum capacity of the high speed steel tools. This construction should not be confused with the soft steel spindle and cast iron box frequently used with varying success.

Lubrication of the spindle bearing is provided for by generous oil wells from which the oil filters to the

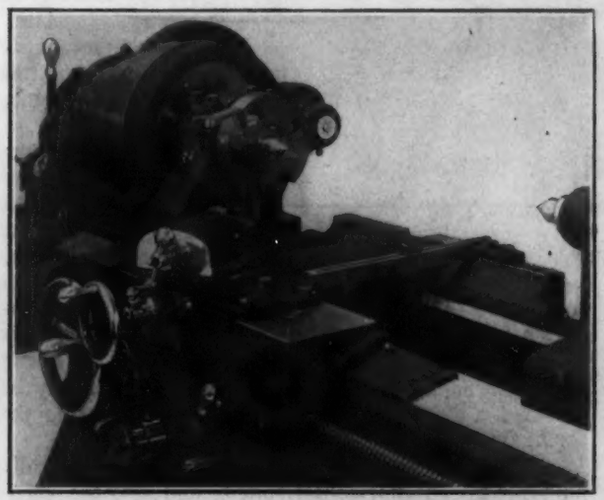


Fig. 4.—A Cone Pulley Lathe with the Same Type of Carriage Showing the Cross Feed Stop Bar.

bearing through felt pads, insuring a continuous supply of clean lubricant. The automatic length stop is best shown in Fig. 1. On the front of the bed is a tee slot in which the tripping dogs are adjustably mounted, and a clutch mechanism in the apron is operated by these dogs, which are set to trip at the required point on the first piece. The longitudinal feed is thrown in and continues until the lever on the left end of the apron strikes the trip dog. This action disengages a square tooth clutch on the drive from the feed rod in the apron and this disconnects the feed. The simple movement of raising the lever disengages the dog and the clutch is automatically thrown into engagement again by a spiral spring. This operation may be repeated as many times as there are shoulders on the work in hand.

The trip dogs are of such shape that the lever rides over them when returning the carriage, making it unnecessary for the operator to give it any further attention. Means are also provided for locking the lever permanently out of engagement when the attachment is not required. It will be seen that the feed motion is disengaged by a rigidly mounted dog which forms a position stop, permitting the duplication of work with considerable accuracy.

The multiple cross feed stop may be seen in Fig. 4. A multiple faced bar (in this case a four-sided bar), with slots in each face carrying adjustable dogs, is journaled directly on the top of the carriage, and a positive stop mounted rigidly and permanently on the cross slide. In operation the adjustable dogs are always set behind the stop on the cross slide, thus permitting the operator to withdraw the tool at any time without disturbing the setting. Rigidity characterizes this construction, without any overhanging parts, so that diameters are easily and accurately duplicated. The stop features, it is believed, will especially interest manufacturers who are alive to the necessity of keeping down shop costs.

## The Garland Corporation.

The stockholders of the Garland Corporation, Pittsburgh, who held their annual meeting recently, reelected directors as follows: John W. Garland, Henry L. Collins, Robert Garland, F. C. Hodkinson, Charles A. Glaser, William H. Hall, J. R. Atwell, T. H. Bopp, Charles Garland and George H. B. Martin. The annual report for the year ending December 31 showed the net earnings to have been $297,000, the largest in the history of the corporation. The officers stated that the outlook for business was bright and that the net earnings for the first quarter would be at the rate of more than $350,000 for the year.

The Garland Corporation is most intimately interested in the building trades, furnishing as it does interior conduits for most of the office structures built in the country. Of late years an increasing volume of conduit business has come from the shipbuilding trade. Through its subsidiary, the Safety Armorite Conduit Company, the corporation has supplied conduits for a large number of vessels for the United States Navy, numerous revenue cutters, transfer tugs, passenger and freight boats, and for all boats built by the American Shipbuilding Company at Cleveland, Ohio.

**A Large Dock Machinery Contract.**—An important contract for dock machinery was secured by H. C. Torrance, the Pittsburgh representative of the Brown Hoisting Machinery Company, and is for the Pittsburgh Coal, Dock & Wharf Company, Duluth, Minn. It calls for the installation of mechanical appliances for the handling at Duluth of coal shipped from Pittsburgh. The Pittsburgh Coal, Dock & Wharf Company is a subsidiary of the Pittsburgh Coal Company. It is claimed that the addition of the new machinery will make the dock the largest and best equipped in the world, having a capacity of 2,000,000 tons of bituminous coal. The order involves the expenditure of approximately $500,000.

C. Drucklieb has disposed of his interest in the manufacture and sale of the Injector sand blast apparatus to James M. Betton, who has had the practical management of this branch of his business for the past five years. The sand blast business will be carried on under the name of James M. Betton, at the old location, 178 Washington street, New York City.

# A New Chicago Milling Machine.

## A Combined Vertical and Horizontal Hand Miller with Improved Universal Centers.

A hand milling machine which in many respects differs from the ordinary types and possesses many valuable and original features has recently been brought out by the Chicago Machine Tool Company, Chicago, Ill. The aim was to produce a machine suitable for the rapid production of the lighter class of milling machine work.

The Chicago Duplex hand millers are built in five sizes, known, respectively, as the bench, the Nos. 1, 2, 3 and 3A. Fig. 1 shows the No. 3A machine with the overhanging arm in place ready for horizontal milling. The horizontal spindle is bored to receive a No. 9 B. & S. taper shank arbor. This illustration

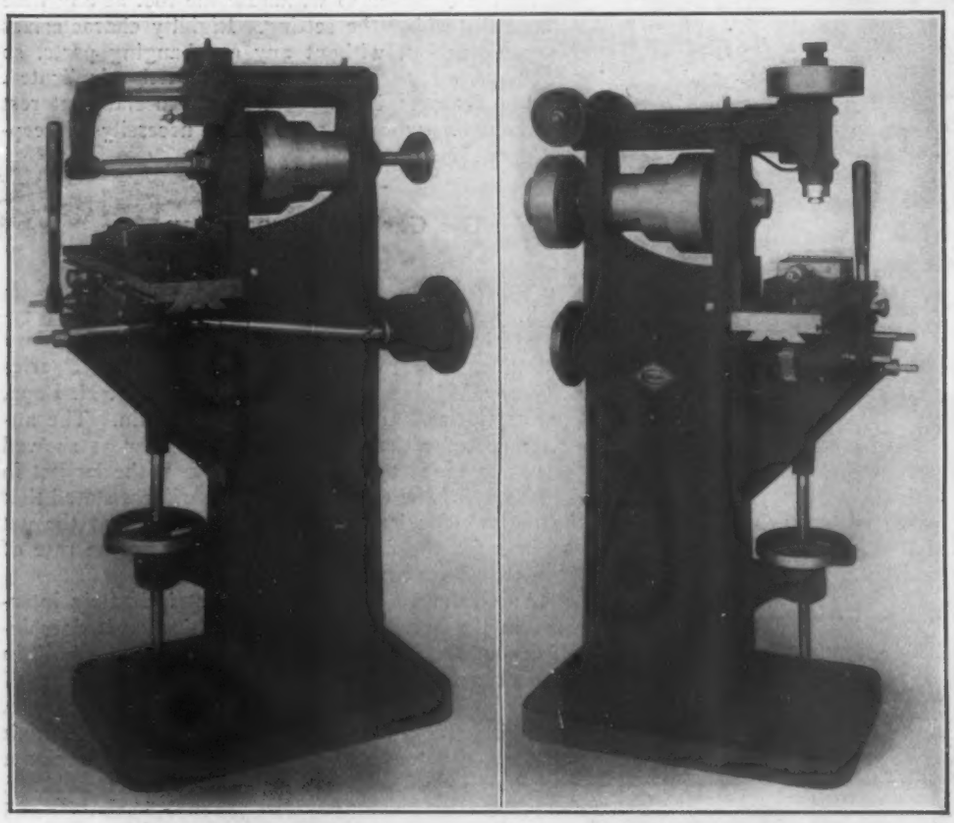


Fig. 1.—As a Horizontal Miller. Fig. 2.—As a Vertical Miller.

The No. 3 A Duplex Hand Milling Machine Built by the Chicago Machine Tool Company, Chicago, Ill.

gives a good idea of the general arrangement of the new machine. It will be noticed that the oil pan regularly furnished on the Nos. 1, 2 and 3 machines has been done away with to facilitate the application of a screw vertical adjustment to the knee, an entirely new feature. The column is of box section and increases in depth as it extends downward toward the pan shaped base.

The knee is of the inclosed box form, with as few openings as possible, and none in the upper surface. This is important, as it obviates chance of the closing together of the surfaces under the strain of clamping the saddle. It also avoids the necessity of a sliding cover to keep chips out of the knee mechanism. A long bearing is provided for the knee on the column to give the required stiffness.

In Fig. 2 is shown the No. 3A machine, with a vertical spindle, which is regularly furnished, in place on the machine. The vertical spindle is among the most important features of the machine, making it particularly adapted to toolroom work, as well as to the use of brass workers and manufacturers of small parts. The vertical spindle is driven by a belt from a pulley on the rear of the horizontal spindle, as will be seen in the illustration. The belt runs over idler pulleys shown at the top of the machine.

The screw vertical adjustment for raising and lowering the knee gives the latter added strength and support. The screw is of four-pitch and the hand wheel has 250 divisions, so that the knee may be adjusted up or down to one-thousandths of an inch, or even finer settings. The indicator is adjustable and may be swung around to any desired position, so that the adjustment can be figured from zero in any position.

An automatic feed is furnished, which is of the most improved design and extremely powerful. It is taken from a cone pulley on the rear of the spindle to a three-step cone pulley on the rear of the gear box. The gear box contains a set of planetary gears, through which the desired reduction of the spindle speed is obtained to give the proper speed to the table. From the gear box the drive is through the universal joint shaft A, Fig. 3, to a pair of 45-degree angle spiral gears, B, in the saddle at B. The worm C is fastened on the same shaft as one of these spiral gears and the whole mechanism is held in the rocker D, which throws the worm in and out of mesh with the rack on the under side of the table through the lever E. The worm has at all times five teeth in working contact with the rack. The power, durability and smooth running qualities of this style of feed are well realized.

In Fig. 3 the details of the quick return of the table through the hand lever F are also brought out. This hand lever feed plays an important part in the operation of the machine, as, when the automatic feed is disengaged by the automatic stops provided, after a cut has been made, quick return of the table may be obtained. This feature aids greatly in increasing the production of the machine.

All important running parts are automatically lubricated. The horizontal spindle and also the vertical spindle run in split bronze bearings, with adjustment for taking up wear. Each split bronze bearing has a slot milled its length, in which slot is laid a wicking, with its ends dipping down into the oil reservoir below. This arrangement furnishes sufficient lubrication for a year's running, permitting high speeds without danger of heating the bearings. The countershaft furnished with the machine is completely self-oiling. Oil reservoirs are cored entirely around the shaft bearings, and the space is filled with cotton and oil. Each bearing has a groove cut in it in which is laid a wicking, the ends of which dip into the reservoir below. The loose pulley on the countershaft is one piece, the oil reservoir for supplying its bearing being cast solid around its hub. The bearing of the loose

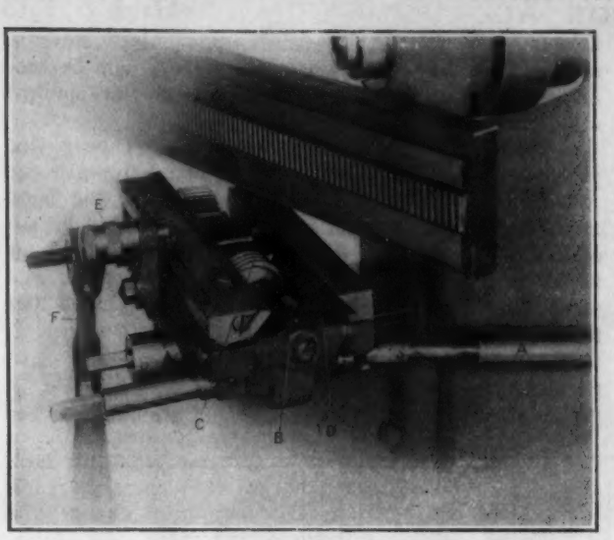



Fig. 3.—Interior Details of the Automatic Feed.

pulley is arranged with a wicking in the same way as the hanger shaft bearings.

The machine has an automatic table feed of 20 in., a traverse feed of 5½ in., and a screw vertical adjustment to the knee of 10 in. This machine is also provided with micrometer adjustment to the longitudinal, transverse and vertical feeds.

**The Universal Centers.**

The universal centers are of improved construction and have a number of new features that make them compact, rigid and accurate. It will be seen from Fig. 4 that the worm wheel is on the front end of the spindle, which allows making it very much larger in diameter than if it were placed in the interior of the head, where it could be no larger than the opening through which the spindle is introduced, or, at most, no larger than the distance between the housings. A large diameter worm wheel is clearly conducive to accuracy, other things being equal, and the placing of the index plate with the index lever directly on the worm shaft eliminates the inaccuracy that may arise on account of indexing through gearing, which is necessary when the index plate is placed on a secondary shaft.

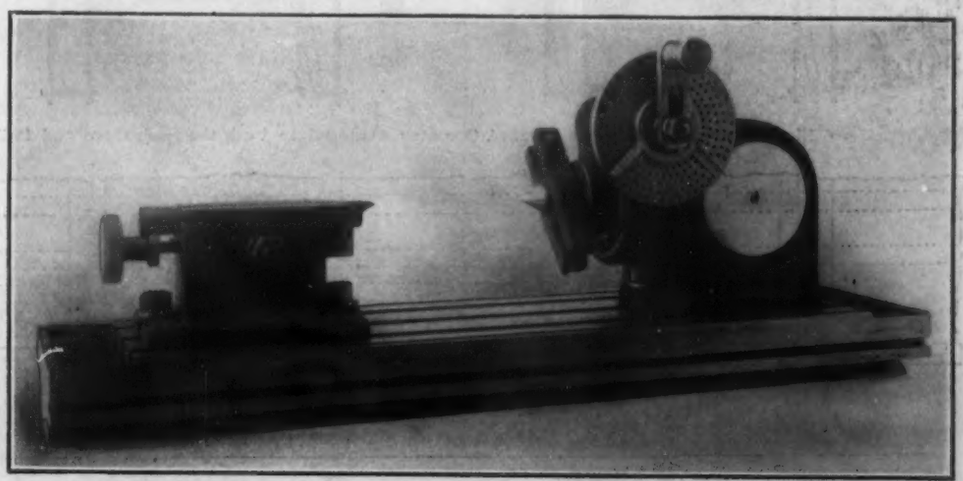


Fig. 4.—The Universal Centers for the Chicago Duplex Hand Miller.

To prevent the spindle from becoming exceedingly high when turned to a vertical position, the center line of the spindle is considerably above the axis of the center block, so that the end of the spindle, when it swings in an arc around this axis, reaches the highest position before it stands in a vertical direction, and commences to move downward before reaching the vertical position. These centers are simple and strong in construction and well suited for the class of work for which they are intended. The spindle is bored to take a No. 9 B. & S. taper shank. One index plate is furnished with the universal centers, having five circles of holes of the respective numbers, 33, 39, 42, 46 and 49, which seem to be sufficient for the ordinary class of work. Additional plates can be furnished on request.

Hill, Clarke & Co., Inc., of Chicago, Boston, New York, Philadelphia and Cleveland, are the sales agents for these machines.

## Better Conditions in the British Iron Market.

Reports from the British iron trade continue favorable, though there is no heavy buying in any department of the market. Consumption in various lines appears to be increasing and the reports from the steel works in Scotland are more encouraging. On the northeast coast of England some good contracts have been secured by the steel makers, with the result that they are competing less sharply with the Scotch producers. Shipbuilders on the Clyde have booked a number of orders for vessels and have been buying plates and angles. Hematite iron shows a slight advance and is firmer in all markets. The high cost of Spanish ore is a factor. West Coast makers of hematite iron have recently advanced their price to 67 shillings 6 pence, which was followed by an advance in East Coast hematite above 65 shillings. There has been a steady market for Cleveland pig iron at 51 shillings 7½ pence for No. 3 at Middlesbrough. Up to March 15 the increase this month in iron in Connal's stores was 4948 tons, as compared with 6292 tons in the first 15 days of February. Stocks of No. 3 on March 15 were 379,561 tons, in addition to 37,653 tons of other iron.

The finished iron trade shows less improvement than is apparent in steel and steel appears to be displacing iron continually. Steel rails are reported firm at £5 10 shillings, at mill, and a fair business is being done. None of the Manchurian order for 20,000 tons went to British mills, the report being that this order was divided between the Hanyang Works at Hankow, China, and American mills. A recent report published in London that the Northeast Coast shipyards have taken orders for seven steamers aggregating 58,000 tons for Canadian owners is not confirmed. It was said that these vessels would be employed in carrying iron ore from Newfoundland to Philadelphia and to European ports.

The export trade in the first two months of the year shows a considerable increase over that for January and February, 1909. The total of British iron and steel products shipped to foreign countries was 761,463 gross tons up to the end of February, 1910, against 594,702 tons in the first two months of last year. There was an increase from 133,000 to 193,000 tons in pig iron, from 74,000 tons to 108,000 tons in galvanized sheets, from 16,000 tons to 22,000 tons in wrought iron bars, and from 22,000 tons to 33,000 tons in steel bars. Rails for the two months fell off from 81,000 tons to 69,000 tons.

The Security Trust Company, Indianapolis, Ind., was appointed receiver March 22 of the Winona Technical Institute, on the application of 18 instructors. The petition asks that the present teachers be retained.

# The Drouve Straight Push Sash Operator.

## A Mechanical Control for Any Number of Pivoted or Hinged Sash.

The Straight Push sash operator, the latest device of its kind, and designed to be nearly foolproof, is manufactured by the G. Drouvé Company, Bridgeport, Conn. A sash operating device in factory service should be built to stand considerable abuse, as pivoted windows are not always made to fit their frames without binding, and force is often necessary to open them. In the new Straight Push operator the direct pushing outward of the sash with two ½-in. steel rods the windows open or close as desired—quickly, surely, and each window has the same power applied. As no lost motion occurs the farthest window on the line operates in unison with the first.

Several different sizes of wheels are made which give the increased power required as the number of sash to be operated is increased. Any number of sash from 10 to 100 or more are easily placed under one control with this operator. The material is heavy and the few connecting couplings are simple and of substantial strength to withstand strain as well as to resist the corrosive effects of gas and acid fumes.

The parts include two arms to each sash and supports for the operating shaft between each window, a guide lever secured to the bracket and a main lever by

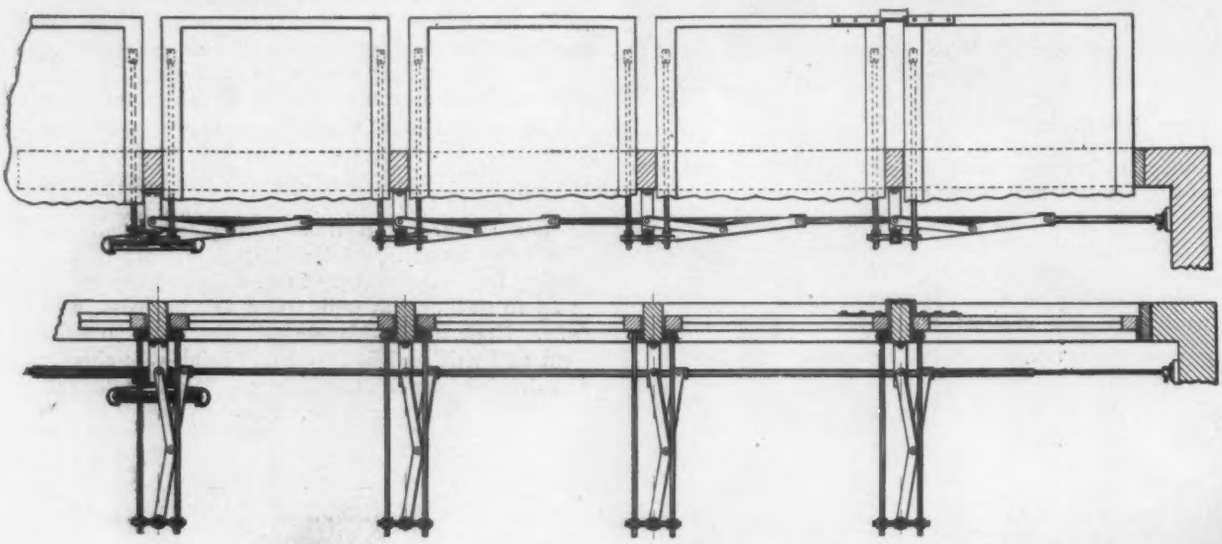


Fig. 1.—Plan Views of the Drouvé Operator Arranged to Push the Sash Open and Pull It Closed.

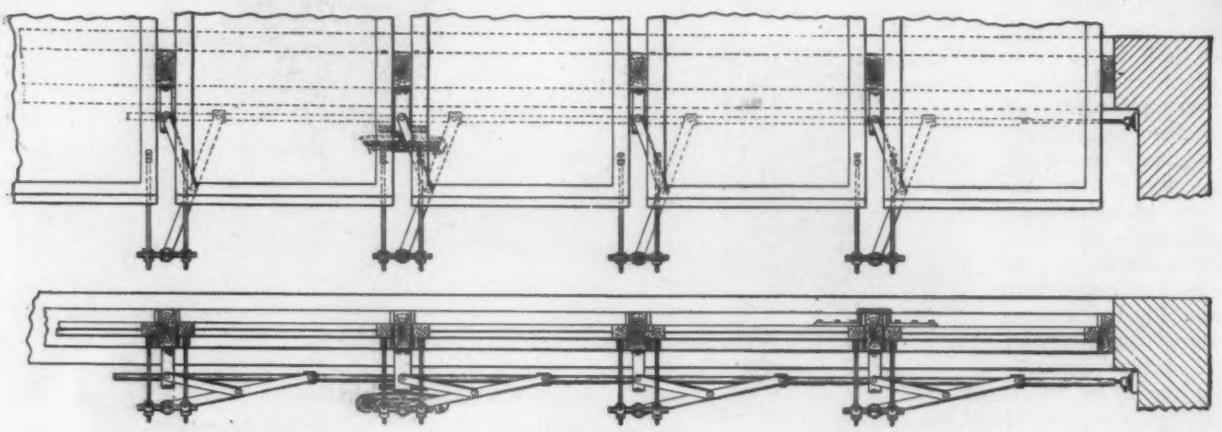


Fig. 2.—The Reverse of the Usual Arrangement.—Pulling the Sash Open and Pushing It Closed.

by leverage, one arm being fastened to each side of the sash at the lower part of the side rail, insures an opening of the window. These two arms are adjustable to give a 30 or 45 degree opening.

A line of ¾-in. pipe shaft to which is fastened the main lever at each sash with an open coupling, is moved backward and forward between spool roller brackets secured at each interval between windows. A rack and pinion with a geared wheel, controlled by a chain from the floor, gives the forward and return movement. A guide lever is secured to the top of each bracket, and in turn is fastened to the main lever. The unattached end of the main lever has a U-chair riveted to it which supports the shaft connecting the two steel arms. While the arms bind to the connecting shaft it works freely in the U-chair support, allowing the arms to follow the inclination of the sash. The movement back or forth of the main shaft operates the levers at each window, and as all arms work simultaneously, the arms being directed straight at each side of the sash, an open coupling to the operating shaft for controlling the movement of the two arms, and a geared wheel which may be placed at any point on the line with a chain to control the rack and pinion, which pushes or pulls the main line backward or forward, opening or closing the sash. The apparatus is adapted to operate pivoted side or pivoted top-and-bottom sash, hinged-at-the-top or hinged-at-the-bottom sash. The operating parts, which are very few, cannot rust together, as the connections are phosphor bronze to iron. This insures its operation at any time.

The device is also adapted to meet unusual conditions that are sometimes met, for instance, where the crane, while not interfering with the hinged or pivoted sash when opened, interferes with the placing of any brackets or parts of an operating device at the normal position of such. Instead of pushing the sash outward from the bottom, the sash are pulled inward from the top and are pushed closed, the reverse movement of opening and closing from its general application. The

usual way of operating is shown in Figs. 1 and 3, and the other way in Figs. 2 and 4. In a monitor or lantern where ordinarily it would be necessary to bring the operating chain down the underside slope of the roof and then to the floor, by reason of the numbers of sash that can be controlled from one point, the operating wheel can be placed at the end of the building, the chain coming down the end wall which gives a direct

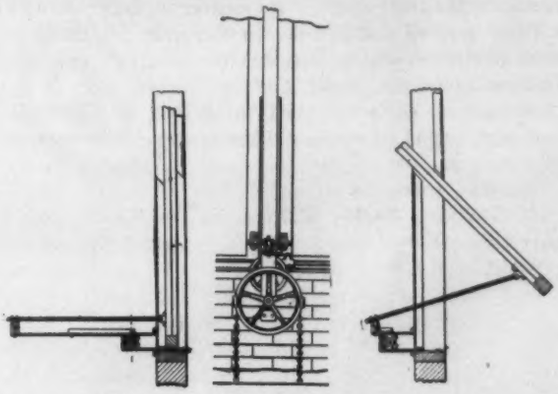


Fig. 3.—End Elevation of Sash Closed, Front Elevation of Operator and End Elevation of Sash Open, Corresponding to the Normal Arrangement as in Fig. 1.

control from the floor, instead of the otherwise indirect method. Idlers or pulleys can be used to turn corners, and the power being applied only after the wheel sets the rack and pinion in motion, the operation is more direct, easier and quicker than with a torsion shaft.

The sash can be opened and held at any position. The straight arms act as a brace against wind pressure. In case of fire drafts can be checked at once by the quick closing of sash made possible with this type of operator. The same holds goods in case of sudden rain or dust storm.

The safety element of this operator is the chain, which controls the operating wheel. This is heavy

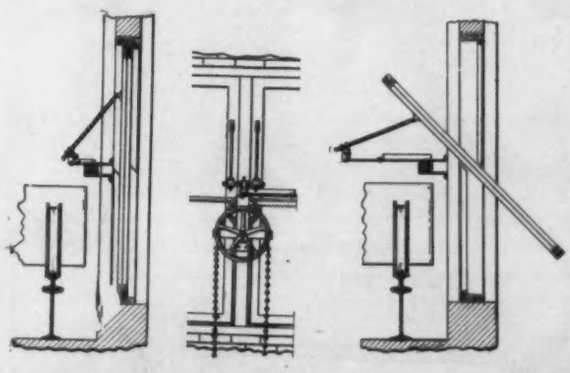


Fig. 4.—The Same Elevations Corresponding to Fig. 2.

enough to operate any required number of sash, but will part under an abnormal strain. The working parts of the apparatus are, therefore, not broken, and the windows all put out of commission where otherwise replacements of vital working parts are very often put off from time to time and conditions endured.

The new steel car works of the Pullman Company at Pullman, Ill., will be supplied with light and power by two 1000-kw. Westinghouse high pressure steam turbines. The steam elements of these units will operate at 150 lb. pressure, exhausting into a vacuum of 28 in., maintained by Westinghouse-Leblanc condensers.

The new French tariff was adopted March 25, the Senate on that day, by a vote of 281 to 5, concurring with the Chamber of Deputies in the adoption of the bill of revision.

## G. E. Alternating Current Grinding and Buffing Equipments.

Alternating current buffing and grinding equipments of improved types for use in wood working, machine and repair shops, foundries, large manufacturing establishments, &c., are being made by the General Electric Company, Schenectady, N. Y. They are principally useful for dressing small castings, accomplishing the work quicker, and giving a finer finish than can be obtained with machine tool, chipping hammer, chisel, &c.

A grinding equipment consisting of an alternating current motor with substantial supports fitted with tool rest and water attachment; these latter accessories being rigidly clamped to the bearing brackets in such manner as to permit ready removal when desired, as shown in Fig. 1. Each end of the extended shaft is fitted with two steel flanges, two leather washers, and a nut for clamping the emery wheel securely in position. The motors are made water and dust proof by being totally inclosed. The shafts, bearings, attachments and all working parts are made extra strong

Fig. 1.—Grinding Equipment.

Fig. 2.—Buffing Equipment.

New Alternating Current Motor Driven Grinding and Buffing Outfits Made by the General Electric Company, Schenectady, N. Y.

and durable to withstand hard and constant usage.

One of these equipments installed in an accessible place enables the workmen to keep their tools sharp, thereby saving time, greatly increasing output and improving the quality of the finished product. Sharp tools require less power to operate than dull ones, and mean a very sensible reduction in the cost of power. Workmen using dull tools are apt to become careless and eventually turn out inferior work, resulting, especially where competition is keen, in loss of the shop's prestige and patronage.

Fig. 2 shows a self-contained, compact and rugged buffing equipment, which is very effective for polishing, and saves considerable time and labor. It is similar in construction to the grinding outfit, with the exception that the tool and water attachments are omitted. The shaft is also longer and each end is tapered and threaded to receive the buffs. The bearing brackets are circular and so designed that they may be turned through 90 degrees to admit of side-wall installation, thus allowing relocation of the device at will.

Equipment of either type can be supplied for operation on single, two or three phase, 110 or 220 volt circuits. The single-phase outfits are made in capacities of ⅓, 1, 2 and 3 hp. and the poly-phase in ⅓, 1, 2, 3, 5 and 7½ hp. Neither emery wheels or buffs are furnished with the standard equipments.

# A New Thread Milling Machine.

## A Special Machine for Making Long Screws Accurately and Rapidly.

A thread milling machine for the rapid production of lead and feed screws, special heavy screws, elevator worms and other work of this nature requiring extreme accuracy and formerly produced on special lathes has been brought out by the Milled Screw & Machine Company, Sayre, Pa., and is illustrated herewith. Fig. 1 is a front view of the machine, Fig. 2 shows more in detail the head of the miller, and Fig. 3 is a rear view of the worm gearing which drives the work.

This machine differs from others now on the market in the manner of mounting the cutter and threading the blank. In the older models the cutter is mounted on a carriage and traverses the bed, but in this new machine the cutter is mounted on a swiveling head, and the blanks to be threaded are secured in a chuck at the end of a large lead screw, and the cutter remains in a fixed position while the work is fed past it. This lead screw is of large diameter to resist torsional strains, and is mounted directly over the center of the bed. This type of construction enables a simple mechanism to be employed, and as there are only a few parts to wear, it is claimed that extremely accurate screws may be continuously cut by an inexperienced man, or that one man can operate as many machines as he can handle the stock for.

This machine will produce threads of any shape or angle, right or left hand, single or multiple, at a rate which is limited only by the highest cutting speed the best steel cutters will stand. The angle of the threads is regulated by fitting the cutter to the proper angle by the swiveling head. This head is capable of vertical adjustment on the round column at the back of the machine, and the spindle is driven through gearing inclosed in the case at the right of Fig. 2. In cutting the thread the blank is gripped from the outside by the chuck jaws at the left end, Fig. 2, and is supported directly under the cutter by a circular bushing bored to the exact size of the blank. In this way the threaded portion is free from any strain after passing the cutter, and bending of the blank, due to side pressure of the tool or cutter, or heating of the blank, which would cause buckling if it were held between rigid centers, is eliminated.

The lead screw is splined its entire length, and is provided with a double worm drive, which imparts a steady, smooth and powerful simultaneous rotary and longitudinal motion to the lead screw. These motions of the lead screw are properly proportioned to the speed of the cutter and permit a cut the full depth of the thread to be made at one operation with a minimum of chatter. The left worm wheel, Fig. 3, is splined to the lead screw and simply produces the rotary motion, while the other imparts longitudinal motion to the lead

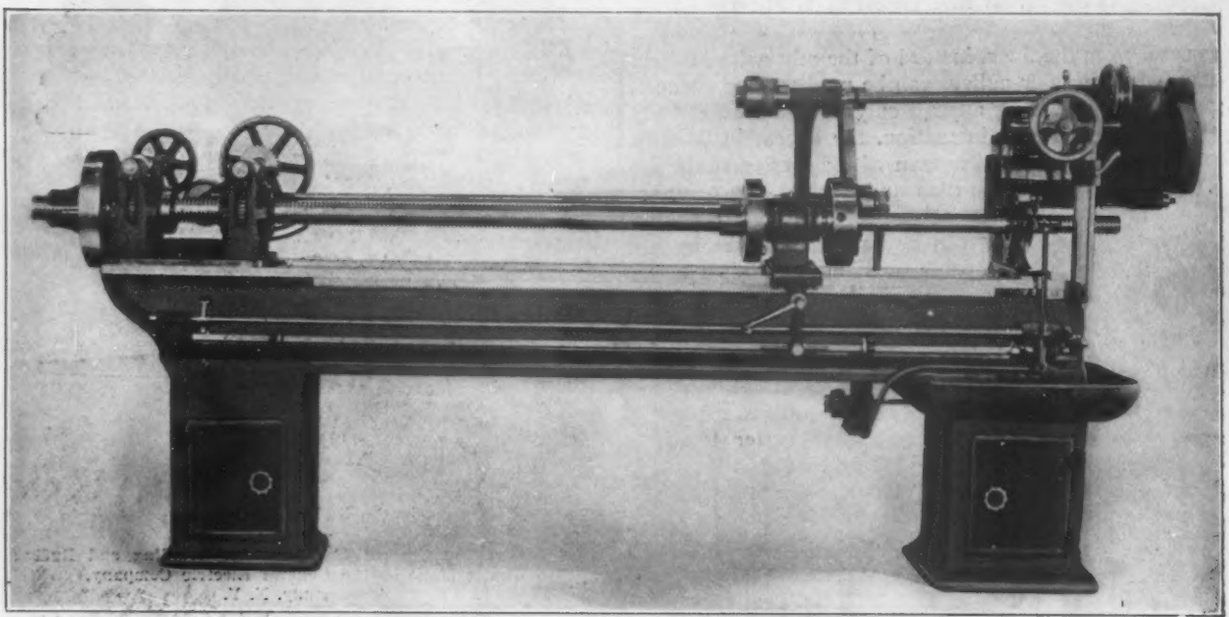


Fig. 1.—The New Thread Milling Machine Built by the Milled Screw & Machine Company, Sayre, Pa.

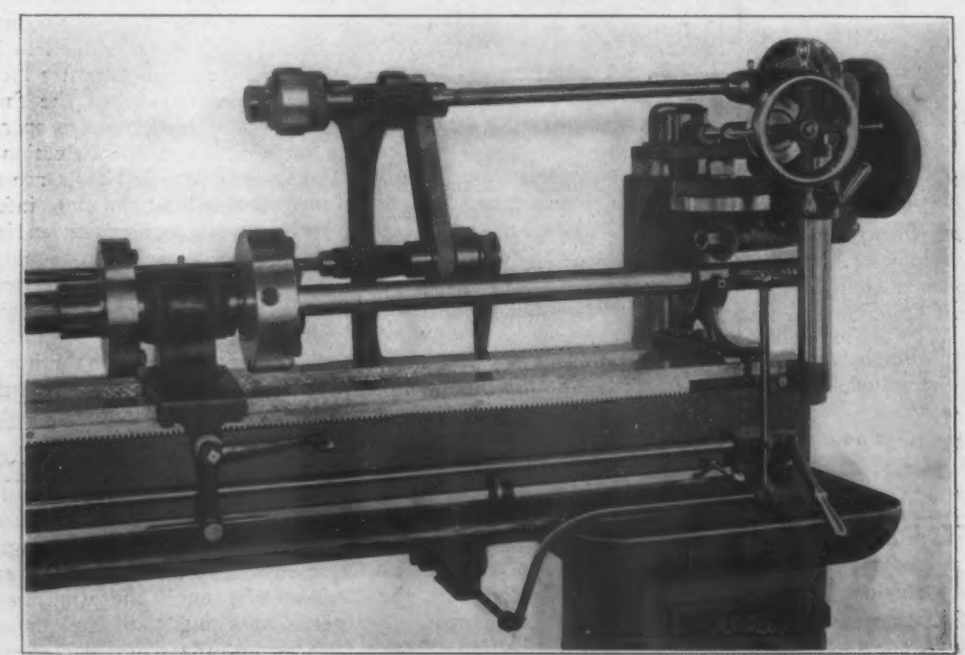


Fig. 2.—Detail of the Working End of the Thread Milling Machine.

screw by driving a split feed nut in either direction according to whether a finer or a coarser pitch than that of the lead screw is wanted. Suitable change gears are provided between the worm shafts for changing the relative speeds of the two motions of the lead screw. The small idler is adjustable along the line passing through the centers of the left worm wheel and itself, and is also adjustable around the circumference of the worm wheel by means of the slotted quadrant. The double worm drive produces a great reduction in the speed of the screw and the divided nut and the ratio varies from 60 to 1 on the heaviest machine to 100 to 1 on the lightest. In this way are avoided the

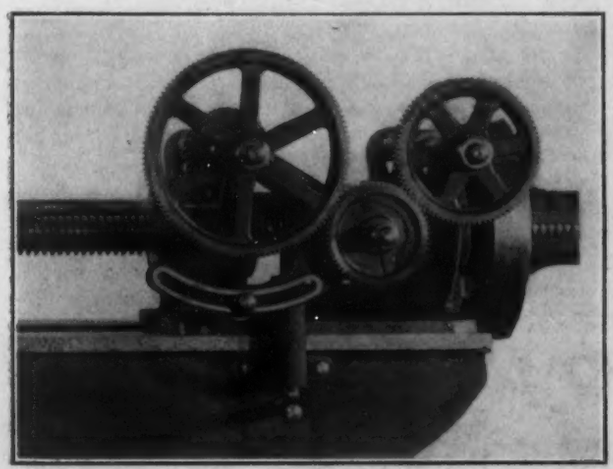


Fig. 3.—Rear View of the Feeding Mechanism.

use of large and many membered gear trains, auxiliary shafts, movable carriage and bearing, and separate means for feeding the carriage and turning the blank, all of which are subject to wear, binding and other strains, and consequent inaccuracy.

The machine is driven from a countershaft or other source of power by the grooved pulley at the right end, or if desired may have a direct motor drive. The power is transmitted directly to the cutter from the pulley shaft through gears. The speed of rotation of the lead screw is controlled through the reducing worm gears by the belt passing over the cone pulleys at the left of Fig. 2, which connects the main driving shaft to the small shaft driving the worm. By shifting the belt on the cone pulleys, the proper speed of the lead screw is obtained for the material to be worked. If the main belt should break the entire machine will stop, and if the small belt of the driving cones should break the feed would stop. If desired an electic motor can be mounted on the head in place of the countershaft. This type of drive, it is stated, enables the machine to operate with less power than the other machines of a similar class now on the market.

Keyways may be cut on any of these machines by using an extra attachment, and collars can be cut to advantage on a shaft by driving the lead screw and feed nut in unison and at a slow speed, and by setting the cutter spindle parallel to the shaft. All work is practically finished when it leaves the machine, and little or no straightening is required, and errors due to lost motion, bending or buckling of the blank are practically eliminated. Five sizes of the machine are built, all of which will cut screws having a maximum diameter of 6 in., while the length varies from 24 to 252 in.

The Pope Tin Plate Company, Pittsburgh, with tin plate mills at Steubenville, Ohio, has opened offices at 204 Dearborn street, Chicago, under the management of Stephen W. Smith.

Reports are officially denied that the National Tube Company will build additional open hearth furnaces at Lorain, Ohio.

## The 13-In. Star Screw-Cutting Engine Lathe.

A 13-in. Star lathe of the same design and construction as the 9 and 11 in. sizes recently remodeled and described in *The Iron Age* August 26, 1909, is now being introduced by the Seneca Falls Mfg. Company, 255 Water street, Seneca Falls, N. Y. The illustration shows the No. 65-E Star lathe of this pattern. It has a 6-ft. bed, with plain and compound rests, and an actual swing of 14⅛ in. over the bed. The head spindle is made of 0.60 to 0.65 per cent. carbon crucible steel and revolves in large ring-oiling bearings; the spindle has a 1⅜-in. hole through it and may be fitted with a draw-in. chuck with split collets 1-16 to ¾ in. in diameter. The tailstock is the curved offset pattern, with long bearings on the bed and the base and has side adjustment for turning tapers.

The carriage is provided with T slots. The cross feed screw has a micrometer collar graduated to read in thousandths of an inch, secured by a friction spring and readily set to any position. All carriages are arranged for a taper attachment which can be applied at any time. Plain and compound rests easily interchange, and a new binding device facilitates quick changes and rigidly binds the rest to the cross slide, which is graduated 180 degrees for setting the compound rest. The automatic cross and longitudinal feeds are actuated by a friction clutch and phosphor bronze worm receiving power from the head spindle through spur gears and a lead screw which is splined. The range for thread cutting is extremely wide; all standard threads right and left can be cut from 3 to 72 per in., including 11½ and 27. The lathes may be equipped with a set of transposing gears so as to cut international standard metric

A New Size (13-In. Swing) of the New Model Star Lathe, Built by the Seneca Falls Mfg. Company, Seneca Falls, N. Y.

threads from 0.5 to 8 mm. in addition to standard United States threads.

The countershaft has a new patented friction clutch with large friction surface on the rim of the pulley. Wear on the friction parts when the pulley is running idle has been eliminated and the usual countershaft troubles reduced to a minimum. The hangers have large ring-oiling shaft bearings adjustable for alignment.

The change gears have rounded edges to avoid injuring the hands. All adjusting screws have a uniform size head to fit the tool post wrench. Patented split spring washers hold the change gears in place, are convenient to operate and facilitate quick shifting. Screws, nuts and small parts likely to become bruised are case hardened, cylindrical surfaces are ground, sliding surfaces hand scraped to a bearing and ample facilities are provided to compensate for wear.

In addition to the attachments mentioned above, a set of blocking 3 in. high to raise the head and tailstocks and the plain, compound and center rests, to increase the swing of the lathe to 20⅛ in. may be fitted to the lathe.

# A RAILROAD SHOP'S CRANE EQUIPMENT.

**The Installation in the Roanoke Shops of the Norfolk & Western Railroad Furnished by the Niles-Bement-Pond Company.**

(*With Supplement.*)

The recently completed shops of the Norfolk & Western Railroad at Roanoke, Va., are especially notable because of the complete equipment of electric traveling cranes installed by the Niles-Bement-Pond Company, New York City, for the rapid and economical handling of material. The accompanying illustrations show the different types of cranes installed in the four buildings—the boiler shop, the erecting shop, the general foundry and the wheel foundry.

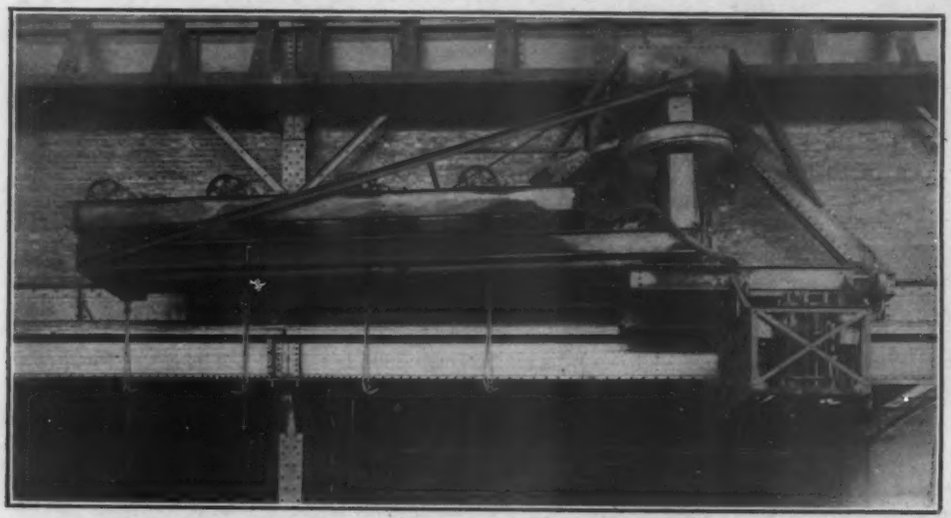


Fig. 1.—A 2-Ton Traveling Wall Crane with Revolving Arm 25-Ft. Long, Built by the Niles-Bement-Pond Company, New York City.

The wheel and soft iron foundry, which is equipped with eight cranes, is an especially interesting part of the plant's equipment. This foundry consists of a main foundry, which has seven of these cranes, and the wheel annealing department located at right angles to the main building. Three of the cranes in the main foundry have a capacity of 15 tons each and the span is 86 ft. 8½ in. These are of the three-motor type and are built so that auxiliary hoists can be attached to the trolley at any time desired. The latticed type of girder construction was adopted because ample headroom was available, and in this way maximum strength and rigidity and minimum dead load were obtained. On each side of the main bay, below these large cranes, there are two 2-ton traveling wall cranes, Fig. 1, running on a track extending the entire length of the building on both sides. These cranes are equipped with an arm 25 ft. long, and one on each side is of the rigid or stationary arm type, equipped with a single hoist and operated by three independent motors controlled from a cage attached to the cranes. The other cranes are equipped with a revolving type of arm or jib which is geared to operate by power through an arc of 90 degrees. The revolving arm wall cranes are equipped with special four-hook trolleys. Each hook is operated by an independent hoisting mechanism equipped with a Niles double disk brake and independent motors. If desired any hoist can be operated independently of the others or all may be operated in unison by a special master controller located in the cage attached to the crane. A general idea of the construction of these cranes and their relative location can be gathered from the illustration of the interior of the foundry, Fig. 3.

The crane over the wheel annealing pits is also provided with a similar four-hook trolley, where the hooks are located at fixed distances, center to center, and so arranged as to lift four wheels at one time. After the wheels are poured in the main foundry they are lifted four at a time by the traveling wall crane and carried to the end of the building and swung under the crane over the wheel annealing pits. The arrangement of these two cranes is shown in Fig. 2. This bridge crane takes the wheels from the traveling wall crane and deposits them in the pits. From the pits the wheels are lifted four at a time and carried to the cleaning shed.

Fig. 2.—A Niles Bridge Crane Over the Wheel Annealing Pits.—One of the Foundry Wall Cranes Is Seen at the Right Extended to Deliver Wheels to the Pit Crane.

One advantage of this arrangement of the foundry is that perfect flexibility of operation is secured. Thus if either the soft iron or chilled wheel work should at any time predominate over the other, it is simply a matter of providing more space for the work required

FIGS. 3, 4 AND 5. VIEWS IN THE FOUNDRY, BOILER SHOP AND ERECTING SHOP OF THE NORFOLK & WESTERN RAILROAD AT ROANOKE, VA.

## A RAILROAD SHOP'S CRANE EQUIPMENT

at the expense of the other work. In this way the amount of space available for any particular class of work can be varied at will by simply moving the pouring space for either kind of casting up or down the foundry without in any way disarranging the method of operation.

The general foundry is equipped with a Niles three-motor crane having a capacity of 15 tons and a 68-ft. span. Although this crane is of the three-motor type, a high speed auxiliary hoist can be attached if desired at any future time, as provision has been made for it. This crane does not differ materially from the standard type of the builder. The boiler shop, Fig. 4, is equipped with a Niles crane of similar construction to that in the general foundry, except that the capacity is 30 tons instead of 15 and the bottom block is provided with a special hook to accommodate the slings for lifting a complete boiler.

The erecting shop is supplied with four cranes, two having a span of 59 ft. and the other two of 68 ft. 2 in. The capacity of all four, however, is the same, namely, 40 tons. Three of these cranes are of the four-motor type, and in addition to the main hoist are equipped with an auxiliary 5-ton hoist which is located on and forms part of the main trolley. This hoist is intended for raising at high speed loads not exceeding 5 tons. In Fig. 5 two of these cranes are shown lifting a complete locomotive. In addition to the standard bottom block, these cranes are provided with a special lifting beam and wire rope sling for attaching to each end of the locomotive.

## The State of Texas and Its Furnace.

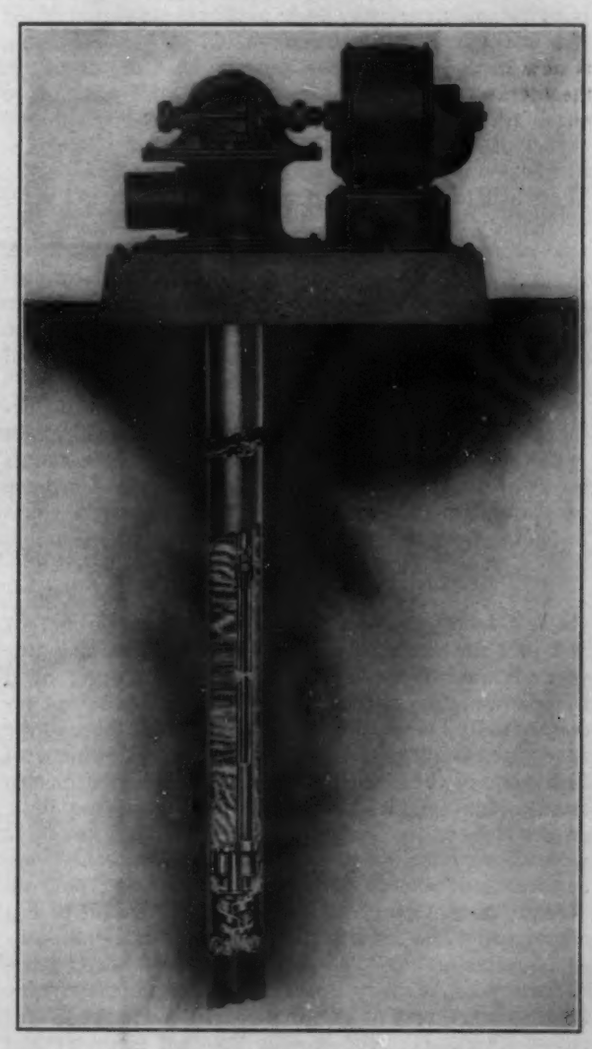
AUSTIN, TEXAS, March 25, 1910.—The offer of W. M. Imboden of Rusk, Texas, representing a syndicate said to be prominently identified with the iron industry in Pennsylvania, to purchase the furnace and iron ore lands of the State of Texas, has been rejected by the Board of Penitentiary Commissioners, which has jurisdiction over the property. The offer was in a tentative form, the object first being to learn whether the State was willing to part with the furnace and ore lands. Members of the board had a conference with the Governor and Attorney-General, at which the conclusion was reached that the board did not have authority under the law to dispose of the property without the special sanction of the Legislature.

It is understood that a lively fight will probably be precipitated in the Legislature when the matter of disposing of the State's iron industry comes before that body. It is claimed by former members of the board and others that the industry was made to pay the State a handsome profit during the administration of the late Governor Lanham and that it could be still made to do so if properly managed. The further charge is made by the advocates of the State retaining the property that the reason it has proved a failure during the administration of Governor Campbell is that it was sacrificed to other features of prison industry, particularly the sugar cane plantations, and that practically all of the able bodied convicts were taken from the Rusk prison, where they had been employed in the iron industry and were sent down to the plantations, leaving the furnace and mines in a neglected condition.

All of the various contentions in regard to the operation and abandonment of the furnace, pipe foundry and iron ore mines will be threshed out when the Legislature meets. Whether the action of the board in shutting down the property and proposing its sale will be upheld by the Legislature is problematical. The fact that Charles M. Schwab and associates are preparing to develop iron ore beds in that part of Texas on an extensive scale causes some members of the Legislature to believe that the State has a very valuable asset in its extensive holdings of ore and should not dispose of them cheaply. Expert opinions differ widely on the question of whether the State can operate the industry at a profit, year in and year out. It is claimed that this might be done if it was possible to eliminate it entirely from politics. H.

## The Blazer Spiral Pump.

A device which is old in principle but entirely new in the application of this principle is the Blazer patent spiral pump made by the Humphreys Mfg. Company, Mansfield, Ohio, and illustrated herewith. Two sizes of the pump are manufactured, having diameters of 8 and 12 in. and capacities of 500 and 1000 gal. per minute. Among the advantages claimed for it are great capacity, durability and efficiency and simplicity of construction. The installation expense is small, as the pump has only to be fitted into the well casing. The latter also serves as both suction and discharge pipes,



The Blazer Spiral Pump Made by the Humphryes Mfg. Company, Mansfield, Ohio.

and there are no suction nor discharge valves to be repaired or replaced.

Two interlocking spirals working in synchronism and connected by cut gears constitute the working mechanism of the lift. The shaft driving these spirals is connected through bevel gearing to the shaft of a prime mover, in this case an electric motor. This long driving shaft is contained in a tube which extends to the bottom of the well, and lubrication is secured by a column of oil within this tube. Ball bearings support the weight of the impellers and the water load, and thus friction is reduced and efficiency increased. The pump runs in one direction as fast or as slow as required, and as slippage has been practically eliminated the spirals act in unison and lift the water. Practically any speed required within reasonable limits can be maintained.

# EMPLOYEES' BENEFIT SYSTEMS.

## Methods in Use by the Carnegie Steel Company, the Western Electric Company and the American Shipbuilding Company.

No little interest is being taken by manufacturers in pension and benefit systems for employees; in part, perhaps, because of the general agitation of the kindred matter of accident liability and indemnity, but more in view of the widespread effort to provide better conditions of employment, regardless of issues raised by organized labor. In *The Iron Age* of December 2, 1909, page 1704, a description was given of the profit sharing, sick benefit and pension system of the International Harvester Company. In the issue of February 3, 1910, page 265, reference was made to the investigation of old age pensions by a State commission in Massachusetts. The report of this commission, a volume of 500 pages, is now in the printers' hands. A valuable addition to the literature of the subject is the twenty-third annual report of the [National] Commissioner of Labor, entitled "Workmen's Insurance and Benefit Funds in the United States." It is an octavo of 810 pages and gives particulars of about 1200 funds or societies which provide insurance for workmen against sickness, accident, death and old age. The data were obtained by personal visits of special agents of the Bureau of Labor to the offices of the fund. Labor organization funds to the number of 530 are dealt with, besides 461 local establishment funds and 50 railroad funds.

As representing the systems in use by manufacturing companies we have selected three which differ in important particulars and below reproduce the accounts given of them in the report. That of the Carnegie Steel Company differs from all other company systems in having been provided by an individual.

### CARNEGIE RELIEF FUND.

This fund was created by Andrew Carnegie in 1901 and provides for accident and death benefits and pension allowances for employees of the Carnegie Steel Company and its constituent companies. It is not incorporated. The employees in no way contribute to the fund, Mr. Carnegie having created an endowment of $4,000,000 of the Carnegie Company bonds, the income from which supplies the annual income of the fund. At the close of the fiscal year December 31, 1908, there were approximately 85,000 employees in the companies' service, and benefits or pensions were being paid on account of the injury, death or superannuation of 804 employees. The office is in Pittsburgh, Pa.

*Administration.*—The affairs of the fund are administered by an Advisory Board, appointed annually by the board of Trustees of the fund. The Advisory Board elects a treasurer from among its own members and appoints a manager and an assistant manager. A part only of the operating expense is paid by the fund, the company furnishing offices, the services of company surgeons, &c. The manager has general charge of all business pertaining to the fund and passes upon all claims, but an appeal may be taken from his decision to the Advisory Board.

*Conditions of Employment.*—There is no specified age limit for entering the company's service. Employees leaving the service forfeit all right to benefits or pension allowances, but if they are re-employed within two years no break is considered to have occurred in the continuity of their service. Time thus lost, however, is deducted in computing length of service. Time lost owing to leave of absence, suspension, temporary lay-off on account of reduction in force or disability is not deducted.

*Disability Benefit.*—Benefits are paid for disablement resulting from accident or cases of sunstroke or heat exhaustion occurring to employees while on duty at the following rates: Unmarried men, 75 cents per day; married men, $1 per day. No benefits are paid until the time lost by reason of the disability aggregates one year, after which time benefits are paid monthly as long as the disability lasts. Benefits are not paid for injuries due to intemperance, unlawful or immoral acts, or for time for which wages are paid by the company. Beneficiaries must not leave the company surgeon's jurisdiction without his knowledge or permission. During the year 88 persons received accident benefits aggregating $20,307.70.

*Death Benefit.*—Benefits on account of death resulting from accident or cases of sunstroke or heat exhaustion occurring to employees while on duty are paid as follows: In the cases of married men, $500 for the widow and $100 for each child under 16 years of age, the total death benefit in no case to exceed $1200; in the cases of unmarried men, $500 for the relative or relatives of whom the deceased was the sole support, or to whose support he was a regular contributor. Benefits are not payable for death due to intemperance or to unlawful or immoral acts. Benefits are paid in monthly installments, the amounts depending on the financial condition of the beneficiaries. During the year benefits amounting to $109,023 were paid on account of the death of 402 employees.

*Pension Allowance.*—Any employee of a constituent company of the Carnegie Steel Company which has been 10 years controlled by the Carnegie interests, who has reached the age of 60 years and has been at least 15 years continuously in the service of the company or the employing constituent company, and is incapacitated for further service, may be granted a pension. Any employee of a company which has ceased to be a constituent company of the Carnegie interests is eligible to a pension allowance, provided that at the time the company by which he is employed left the Carnegie interests he had reached the age of 55 years, had been 20 years in service, and his case fulfills all the other requirements. In such cases only such time as was given by the employee to the Carnegie interests is included in computing length of service. If an employee becomes permanently totally disabled from sickness or injury while not on duty before reaching the age of 60 years, provided his case fulfills all the other requirements, he may be granted a pension. A physical examination by a company surgeon, or some other surgeon satisfactory to the manager, is made of all applicants for a pension allowance.

Pension allowances are paid monthly for life on the following basis: For each year of service, 1 per cent. of the average regular monthly pay received for the entire term of service. Pensioners may engage in any gainful occupation outside of the company's service. During the year 555 persons received pension allowances amounting to $81,093.

If at any time the total benefit payments and pension allowances should exceed the annual income, the regulations provide for a ratable reduction in all allowances and benefits. No assignment of pensions or benefits is permitted. Pensions or benefits may be withheld or terminated on account of any misconduct on the part of the beneficiary.

*Cases of Benefit on the Roll During the Fiscal Year Ending December 31, 1908.*

| | Accident. | Death. | Pension. | Total. |
|---|---|---|---|---|
| At beginning of year | 60 | 231 | 438 | 729 |
| Added | 28 | 171 | 117 | 316 |
| Completed or dropped | 25 | 176 | 40 | 241 |
| At close of year | 63 | 226 | 515 | 804 |

## WESTERN ELECTRIC COMPANY PENSIONS.

The Western Electric Company instituted the Western Electric Company's Pension System in 1906. It is not incorporated. The number of employees of the company at the close of the fiscal year ending November 30, 1907, was 7000. The fund makes provision for the employees of the company who through age or infirmity may become unable to continue in active service, and also, under certain conditions, for those of the employees who may become totally incapacitated from further work through sickness or injury. The office of the fund is located in Chicago, Ill.

*Administration.*—The fund is managed by the company and its affairs are administered by a Pension Board, consisting of five officers or employees of the company, appointed annually by the Board of Directors or Executive Committee. The Pension Board elects a chairman and secretary. These officers authorize the payment of the benefit allowances, make and enforce rules for the efficient administration of the fund, and decide, within the general limitations prescribed by the Board of Directors or Executive Committee, such questions as may arise in connection with the pension system. Any action of the Pension Board shall require the affirmative votes of at least three of its members. The officers administrating the fund are not bonded as such. The moneys constituting the fund remain in the custody of the treasurer of the company, and the fund draws interest from the company at the rate of 4 per cent. per annum. The fund accounts are audited annually by the company's auditor. The Pension Board passes upon all claims to benefits, and where dissatisfaction with its action arises recourse may be had to the Board of Directors or Executive Committee of the company. The sum of $400,000 was set aside by the company from its profits at the time the fund was instituted, and, in the absence of action by the company's Board of Directors, the president of the company may have sums not exceeding $150,000 annually withdrawn from the company's profits and added to the fund to guarantee payment of benefits. The supplementary income to the fund is derived from interest. All employees engaged in any capacity in the operations of the company who have reached the age of 60 years and have been 20 or more years continuously in the service of the company may, at their own request or at the discretion of the Pension Board, be retired from active service and become eligible to pension. Any employee who has been 10 years or more continuously in the service and has by reason of injury or sickness become totally incapacitated from further work for the company may or may not receive aid from the pension fund, at the discretion of the Pension Board. If the aid is granted it shall be for such amount and for such period as the Pension Board may determine.

There is a general qualification to the payment of all benefits under the system, as follows: No employee shall be considered to have a right to be retained in the service of the company or any right or claim to any pension allowance, and the company expressly reserves its right and privilege to discharge any officer, agent or employee when the interests of the company in its judgment may so require, without any liability or any claim for a pension or other allowance other than salary or wages due and unpaid.

*Permanent Disability and Superannuation Benefits.*—Payments are made on the last day of each month. The rate of payment for age is conditional upon the number of years the employee has been in the active service of the company and the amount of his average wages per year for the 10 years next preceding retirement. For each year of active service the annual rate is 1 per cent. of the average annual pay during the 10 years next preceding retirement. The rate of benefit payment for total incapacity due to injury or sickness is determined by the Pension Board in each particular case. The period of payment for age is from date of retirement to death, and, at the discretion of the Pension Board, allowances may, in exceptional cases, continue to widows or orphans for a further period not exceeding one year. Benefit payments may be suspended or terminated by the Pension Board in all cases of gross misconduct. The beneficiary may engage in any other than the company's business where such business, in the judgment of the Pension Board, is not prejudicial to the interest of the company. During the fiscal year ending November 30, 1907, there was one person, a high salaried electrical engineer, receiving permanent disability benefit, and 18 persons were receiving superannuation benefits.

*Receipts and Disbursements.*—The receipts and disbursements of the fund for the fiscal year ending November 30, 1907, were as follows:

*Receipts.*

| | |
|---|---|
| Cash on hand at beginning of year | $558,677.81 |
| Interest | 22,325.70 |
| Total | $581,003.51 |

*Disbursements.*

| | |
|---|---|
| For permanent disability | $2,400.00 |
| For superannuation | 2,004.87 |
| Cash on hand at end of year | 576,598.64 |
| Total | $581,003.51 |

## AMERICAN SHIPBUILDING COMPANY BENEFITS.

The American Shipbuilding Company of Cleveland, Ohio, has a contract with a life insurance company to insure its employees against death or disability from accident while actually engaged in the occupation and at the places mentioned in the policy. This form of contract is a workman's collective accident policy and is described on pages 660 to 662. At the close of the fiscal year December 31, 1906, the 7000 (estimated) employees of this establishment were so insured. This system of benefits was instituted in 1902.

*Administration.*—The establishment does not administer the affairs of the benefit features other than by making the weekly deductions for insurance from the wages of employees and paying the insurance premium. The insurance company's physicians pass on all claims. Beneficiaries may have recourse to legal proceedings for recovery, to be begun within six months from time of death, loss of limb or sight, or the termination of the disability.

*Conditions of Membership.*—All employees who are 16 years of age and over are required to become members. Ten cents per week is deducted from each employe's wages by the company to pay for this insurance. When the employees are disabled or in receipt of benefits they are relieved from contributing to the fund.

*Temporary Disability Benefit.*—For temporary disability the insured is paid a weekly allowance of one-half his usual weekly wages for a period not to exceed 26 weeks. All cases are paid for from commencement of disability; accidents reported to the foreman immediately after they occur entitle the insured to be paid each pay day. Beneficiaries must report to the insurance company's physician once each week, or oftener if required. Benefits are forfeited for noncompliance with the rules of the insurance company. It is a condition of this insurance that an injured employee who fails to comply with instructions of the insurance company's surgeon (even though injured and employing another surgeon at his own expense) or who fails to report to the surgeon's office as often as instructed and at the times appointed, or who in any manner wilfully or negligently fails to give proper care and attention to his injuries, will by such conduct forfeit all claims thereunder. Beneficiaries who have exhausted the maximum period of benefit payments are not entitled to any further benefits. During the fiscal year about 1500 members received benefits for temporary disability.

*Death Benefit.*—The payment made in case of death from accident (within 90 days from such injuries and

independent of all other causes) is an amount in cash equal to a half year's wages. Claims are usually settled in one week. Benefits are forfeited for noncompliance with the rules of the insurance company. There were 10 deaths during the year for which insurance was paid.

*Permanent Disability Benefit.*—For the irrecoverable loss of sight of one eye one-sixteenth of one year's wages is paid. For the loss of one hand or one foot, one-sixth of one year's wages is paid. For the loss of both hands or both feet, or one hand and one foot, or the sight of both eyes, one-half year's wages is paid. These amounts are paid in a lump sum. Benefits are forfeited for noncompliance with the rules of the insurance company. Thirty-one persons received permanent disability benefits in lump sums during the fiscal year.

*Other Benefits and Privileges.*—Surgical, ambulance and hospital services are provided and physicians are employed as part of the agreement with the insurance company.

## The Swartwout Automatic Safety Water Gauge.

So far as is possible the dangers resulting from broken gauge glasses and the consequent damage to both attendent and boiler are eliminated in the Swartwout automatic safety water gauge, Fig. 1, manufactured by the Ohio Blower Company, Cleveland, Ohio. Quick closing automatic valves operate instantly, cutting off the flow of water and steam if the glass breaks.

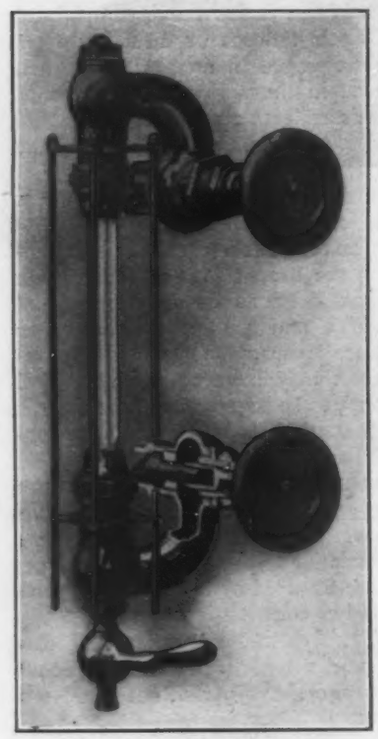


Fig. 1.—The Water Gauge.

In each of the two gauge bodies there is an automatic valve held away from its seat, while in use, by a spring, shown at F in the sectional view of the gauge cock, Fig. 2. In case of breakage this valve is closed quickly by the steam pressure in the boiler. The valve is also controlled by the hand wheel, so that both valve and valve seat are easily removed for cleaning without disturbing the gauge at the boiler connections, and without removing the packing of the gauge glass. The screw E holds the parts of the valve together, and when taken out with a small screwdriver or penknife all the parts are released. At the inner end of the valve stem C a flat scraper D loosens any sediment adhering to the boiler connection, and as it revolves with every turn of the hand wheel the opening is cleared frequently. The removable valve case A is provided with two external threads of the same pitch, but of different diameters, so that the threads on the inner end may slip by the outer internal thread when inserted. The threads are cut so that both sets engage the threads of the gauge body at the same time, thereby insuring a good fit.

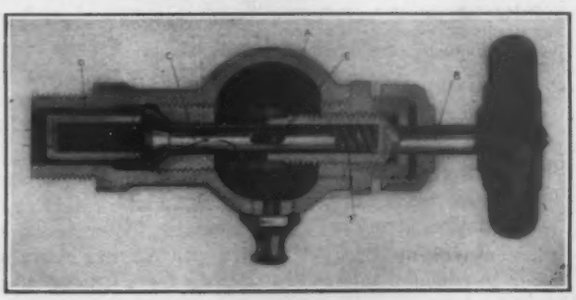


Fig. 2.—The Gauge Cock.

The New Swartwout Automatic Safety Water Gauge and Gauge Cock, Made by the Ohio Blower Company, Cleveland, Ohio.

After replacing a broken glass the hand wheel is turned forward until the valve is forced from its seat, thus allowing water or steam to flow from the boiler into the gauge glass; the valve on the other gauge body will then automatically open to equalize the pressure. In turning the hand wheel forward to force the valve from its seat, the movement of the spring F in the stem B must first be taken up before the valve moves. Every turn of the wheel turns the valves upon their seat. In this way they regrind themselves automatically.

When the valve case is removed there is an unobstructed opening into the boiler 1 in. in diameter, obtained without in any way disturbing the gauge bodies. With other water gauges the removal of the valve requires the replacing of the gauge body, which means an extra turn to make a steam tight joint, and in some cases even then it is impossible to make the joint tight.

Another ingenious feature of the Swartwout gauge glass is the goose-neck gauge body. This form of construction allows a gauge glass 2 to 4 in. longer than with other makes, thus giving greater visible range of water level. Offsetting the gauge glass renders the operation of replacing the broken gauge glass an easy task. It is inserted through either the top or bottom of the gauge without in any way disturbing the valves or seats. It need not be of an exact length, as an inch or more makes no difference. It permits the use of softer packings, which, with the flexible construction, relieves the strain on the gauge glass, thereby greatly reducing breakages. In cleaning also the value of the goose-neck is apparent, for by simply removing the top plug or the drain cock at the bottom, the swab for cleaning is easily inserted without disturbing the valves or gauge bodies.

The Swartwout water gauge and gauge cock are made extra heavy to withstand a pressure of 250 lb. They are adapted to all types of boilers and for marine, locomotive, stationary and portable service. They are always provided with four rods and a glass 24 in. long.

**The Stove Manufacturers' Convention.**—The thirty-ninth annual convention of the National Association of Stove Manufacturers will be held at the Hotel Astor, New York City, on Thursday and Friday, May 12 and 13. This change of the opening day for the convention from Wednesday is in accordance with the action taken by the association last year and affords opportunity for the other allied national and local associations to meet earlier in the week and finish their work so as to enable their members to bring before the National Association any matters that should receive its attention. President William J. Myers has appointed the following Reception and Entertainment Committee: Henry T. Richardson, chairman; Edward Benedict, A. L. Canfield, Richard E. Warner, Alfred E. Stockbridge, Edward W. Peck, Joseph F. Kernan, James A. Buckwalter, John R. McKnight, James C. Patten, Robert G. Bryan, Henry Terstegge, Charles C. Huntington, F. Percy Loth, W. J. Anderson, William A. Dwyer and Timothy P. Castle.

# The New Robbins 14-In. Engine Lathe.

## Power and Simplicity Are Its Principal Characteristics.

The 14-in. engine lathe illustrated in Fig. 1 is typical of a new line which has been brought out by the Robbins Machine Company, Worcester, Mass., as its standard. The lathe is powerful and rigid enough to use high speed steel tools. At the same time it has been made as simple as possible, on the theory that for many classes of work few attachments are required. A gear box of simple construction gives four changes of feed, covering ordinary lathe practice. The gear box is not employed in thread cutting, the various pitches being secured by the use of change gears. The apron has adjustable friction drive for both the cross and longitudinal power feeds.

The gear box, the interior mechanism of which is seen in Fig. 2, is of the sliding gear type. The cone of gears is mounted on the feed rod, engagement with which is secured by a clutch. On the rod is an adjustable collar, which acts as a stop. When the carriage strikes the stop the clutch in the gear box is released and the feed ceases. As has been stated, the gear box is not used in connection with thread cutting. When the lathe is employed for this purpose the feed clutch is disengaged, and the clutch on the lead screw, seen at the right of the gear box, is thrown in.

The interior of the apron is shown in Fig. 3. The two frictions, for the lateral and longitudinal feeds, are operated by hardened steel cams and expansion fingers. The latter are adjustable for wear by a screw at their base. The steel rack pinion is supported on a bearing close to the rack, which is also of steel.

The headstock is made with either three or four step cone pulley for a wide belt, with speeds in approximately geometrical progression. The crucible steel spindle is ground and fitted to scraped bearings of phosphor bronze. The tailstock also has a crucible steel spindle and is constructed to permit the compound rest to be used parallel with the bed. The heavy carriage has a long bearing on the ways. The compound swivel and actuating screw are graduated for convenience of adjustment. The bed, of deep box construction, is heavily braced by cross girders and has large vees. The countershaft has self-oiling boxes and rim friction driving pulleys, which can be oiled while running. Dimensions of the machine follow:

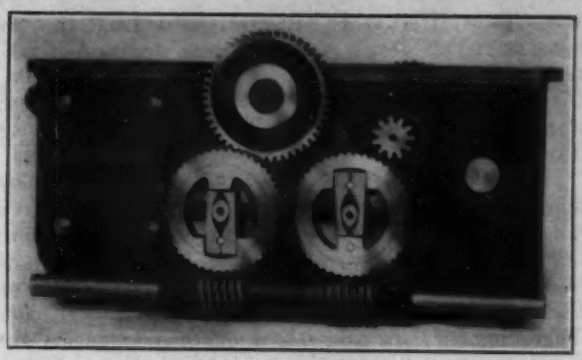


Fig. 3.—Interior of the Apron from the Back.

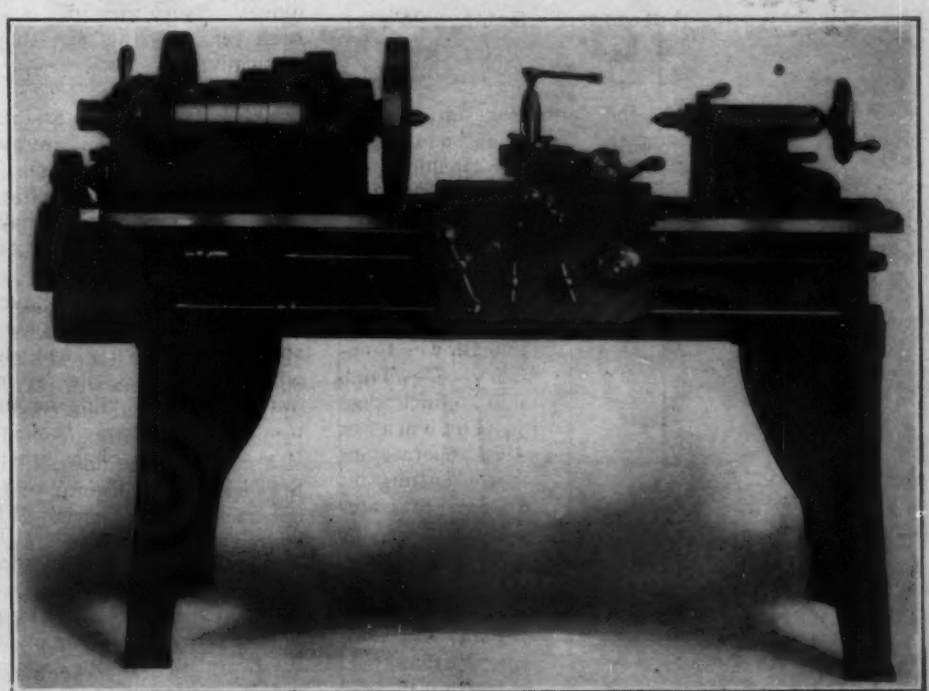


Fig. 1.—The New 14-In. Engine Lathe Built by the Robbins Machine Company, Worcester, Mass.

| | |
|---|---|
| Swing over bed, inches | 15 |
| Swing over plain rest, inches | 10 |
| Swing over compound rest, inches | 9 |
| Swing over elevating rest, inches | 8½ |
| Ratio of back gearing | 9 to 1 |
| Front bearing of spindle, inches | 2¼ x 4¼ |
| Hole through spindle, inches | 1 1/16 |
| Centers Morse taper | No. 4 |
| Threads cut per inch | 3 to 30 |
| Takes between centers on 6-ft. bed, inches | 36 |
| Countershaft pulleys, inches | 4½ x 11 |
| Countershaft speed, revolutions per minute | 160 |
| Weight complete with 6-ft. bed, pounds | 1600 |

The lathe is also made to swing 16 in. over the ways with extra heavy head, tail and carriage, and a four-step cone taking a 3-in. belt. The company also builds this machine in 12 and 15-in. sizes.

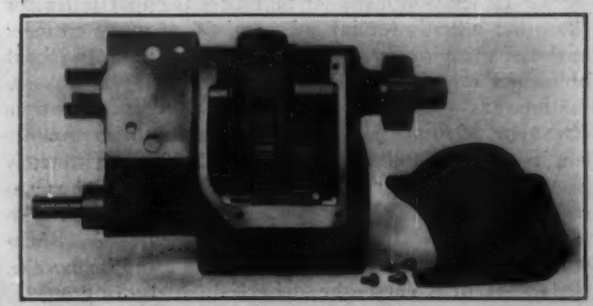


Fig. 2.—Interior View from the Back of the Feed Change Gear Box.

The Whitaker-Glessner Company, Wheeling, W. Va., controlling the Crescent Iron Works, manufacturer of sheets, and the Wheeling Corrugating Company, manufacturer of tin and terne plate, galvanized sheets and roofing, has increased its capital stock from $3,000,000 to $5,000,000, and contemplates making some large additions to its plants.

The Southern Iron & Steel Company is stated to be contemplating the erection of another blast furnace at Gadsden, Ala.

# The Stave Flaming Arc Lamp.

## One of the New High Efficiency Lights of Alternating-Current Type.

Flaming arc lamps are so called because of the chemical composition used in the carbons for these lamps which produces an arc which resembles an open flame. Quite a few compositions are used, but the most successful ones contain a preponderance of calcium salts. The idea of using luminous salts in combination with the carbons is comparatively an old one, as French and German inventors used this process as far back as 1877. The principal difficulty is that carbons treated in this way exude silicon slags due to the silicate binders necessary for the manufacture of these carbons. The carbons, however, were improved from time to time, and gradually the vertically aligned carbons were replaced by downward inclined carbons. The latest practice is to fill the shell of pure arc lamp carbons with a core of a combination of luminous salts.

Fig. 1.—Exterior.

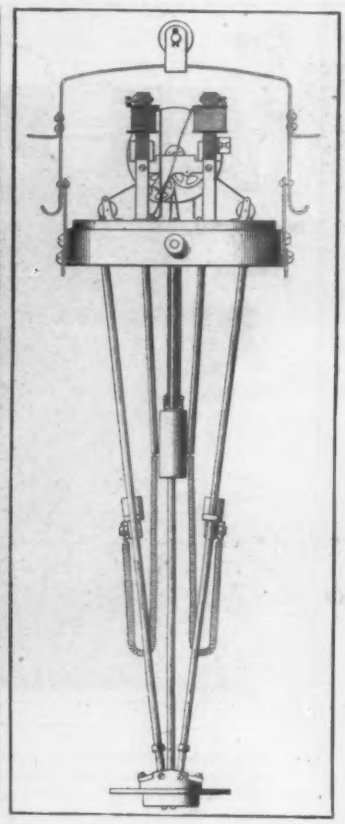


Fig. 2.—Sectional View.

The Alternating-Current Flaming Arc Lamp Made by the Stave Electrical Company, New York.

The light emitted by these carbons is generally of an agreeable warm, orange color.

The downward inclined disposition of the carbons necessitated the construction of an entirely different type of lamp, and as the most suitable voltage for these carbons varies from 45 to 47 volts, it was necessary to design an arc chamber with a very much greater sensitiveness than that used for the original open arc or for the inclosed arc. The luminous intensity of the flaming arc varies approximately as the square of current within certain limits, and it was necessary to design lamps in such a way that the slightest disturbance in the electrical conditions of the arc would be promptly and immediately taken care of.

The accompanying illustrations show the alternating-current Stave flaming arc lamp, manufactured by the Stave Electrical Company, 27 West Twenty-seventh street, New York. Fig. 1 shows the exterior of the lamp, and Fig. 2 gives an idea of the details of its construction. The arc is entirely governed by a motor element, which is similar to that used in the construction of electric meters. The two yokes are differentially wound; one is in multiple, and the other is in series with the arc, and are so designed that one has a tendency to run the motor in the clockwise direction, and the other in the counter clockwise direction. By properly proportioning these windings, the aluminum

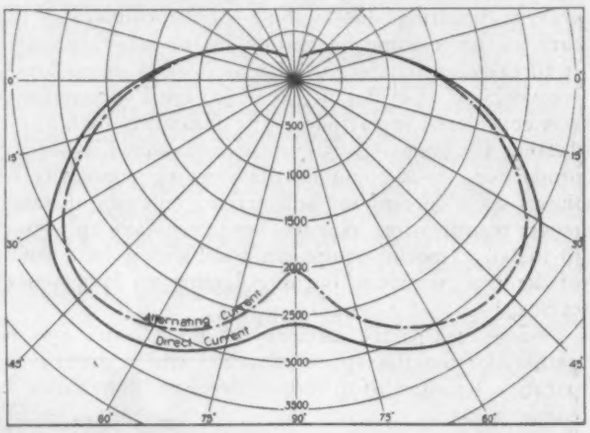



Fig. 3.—Polar Candlepower Curves Showing the Light Distribution from Stave Flaming Arc Lamps.

disks forming the rotary element will remain stationary whenever the best electrical conditions which have been previously determined experimentally to be 10 amperes and 45 volts are obtained at the arc. As the carbons burn away through natural consumption, the voltage will increase, and therefore the flux in the shunt element of the mechanism increases, with the result that the disk will turn toward this shunt element until the original electrical conditions have been reestablished. In practice, this mechanism is very sensitive, and must be adjusted within ½ to 1 volt, so that the disk will immediately re-establish the original voltage as soon as the carbon is burned sufficiently to cause a drop of potential of 1 volt above the 45-volt standard. On account of this low voltage, it is necessary to burn these lamps in series of two on 110 volts, or in series of four on 220 volts. In the latter case the lamps can be equipped with substitutional resistances that will automatically take the place of the lamp in case of damage of one of the four.

The latest type of Stave flaming arc lamp is a considerable improvement over the earlier types, particularly in the arrangement for carrying off the fumes generated by the combustion of the luminous salts in the carbons. This is obtained by a long chimney arrangement, which, it is stated, will cause a permanent draft through a natural tendency of the hot fumes to ascend. This improvement eliminates one of the earlier drawbacks of the Stave flaming arc lamp—namely, the obscuring of the globe due to the deposit of fumes after the lamp had been in operation for some time. Most of the fumes are now carried away by the chimney, and whatever sediment remains in the lamp will be on the highly polished inner surface of the chimney. This can be easily wiped off whenver convenient, generally when the lamp is retrimmed. This does away entirely with the cleaning of the globes and consequent risk of breakage.

Another great improvement in the alternating-current type of lamp is that the use of the blow magnet has been entirely dispensed with. This blow magnet is generally used for the purpose of compelling the arc to make the downward sweep and spread out in fanlike fashion, thus increasing the visible downward surface of the arc, and therefore the illumination below the horizontal, as is shown in Fig. 3, which shows the general distribution of the light in both the alternating and direct current models. In the Stave flaming arc lamp

this has been accomplished by the disposition of the arc chamber and the carbons, shown in detail in Fig. 2, in such a way that the carbons themselves are used as one complete turn, to create flux in the arc chamber, which for this purpose is made of iron. Incidentally, this arrangement has also the advantage of avoiding the heretofore troublesome renewal of arc chambers due to the use of porcelain and other brittle material. The mechanism for feeding these lamps, it is claimed, has also the advantage of being sensitive enough to prevent flickering, due to some slight inequality of the carbons, or to some fluctuation in the supply voltage. It furthermore enables the lamps to burn on as low a frequency as 25 cycles, a feat which until very recently was considered impossible. The feasibility of burning flaming arc lamps on 25 cycles has assumed important proportions on account of the growing popularity of the 25-cycle current for mill driving and long distance power transmission, as it has been necessary up to now to install a special equipment for lighting on account of the impossibility of burning flaming arc lamps on 25 cycles.

Some idea of the efficiency of these lamps may be gathered from the appended table, which gives comparative statistics of different forms of illumination in common use:

| | Cp. | Volts. | Watts each. | Watts per cp. |
|---|---|---|---|---|
| Incandescent lamps | 16 | 110 | 55 | 3.5 |
| Tungsten lamps | 16 | 110 | 20 | 1.25 |
| Ordinary arc lamps | 500 | 110 | 660 | 1.3 |
| Cooper-Hewitt lamps | 700 | 110 | 385 | 0.6 |
| Stave flaming arc lamps | 3,000 | 55 | 550 | 0.18 |

From these figures it will be seen that to obtain the same amount of light, 3000 c.p., would require the installation of six ordinary arc lamps, or 188 incandescent lamps, whose current consumptions are 3960 and 10,300 watts, respectively.

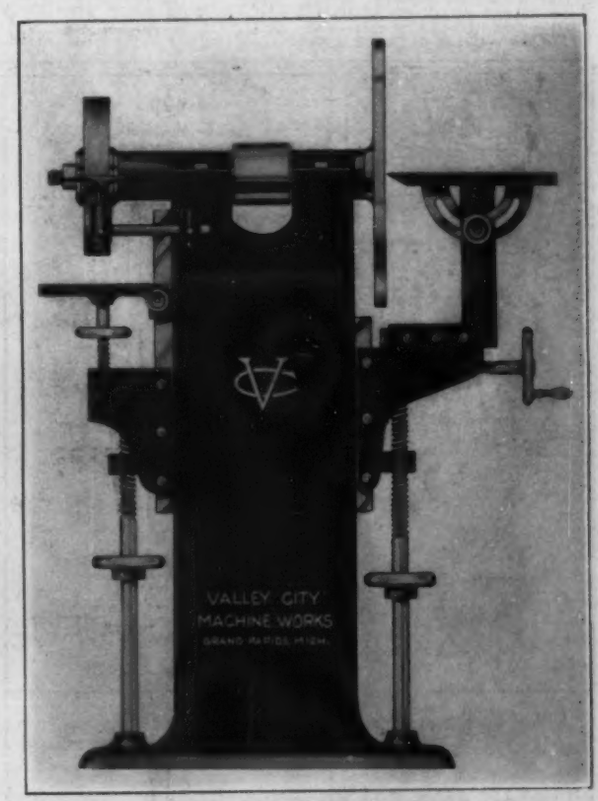
With these lamps practically all shadows are eliminated because of the peculiar arrangement of electrodes employed. The feature which makes the lamps particularly efficient is the brilliancy of the source of illumination. Flaming arc lamps give a pale yellow light, which seems more powerful in penetrating smoke and vapors than any other kind of illumination. This particular type of light is, therefore, especially suitable for foundries and for factories in which considerable vapor and smoke is present in the atmosphere. In fact, in one factory four of these lamps illuminate a building, 50 x 300 ft., at a saving of about two-thirds of the cost of ordinary arc light illumination.

Two models are made for use on either direct or alternating-current circuits. The only difference between the two models is the length of time which the lamps will burn, as one is what is known as a 10-hour lamp and the other as a 17-hour lamp. The method of feeding the carbons is essentially the same in both alternating and direct-current types, although the means is different. In the latter differentially wound solenoids having their common armature attached to a swinging lever, which imparts lateral motion to the lower end of the positive carbon, are used instead of the induction motor employed in the alternating-current lamp.

**The Blaw Collapsible Steel Centering Company Buys a Plant.**—The Blaw Collapsible Steel Centering Company, Pittsburgh, has acquired the plant formerly operated by the Pittsburgh Industrial Iron Works, at Reynoldsville, Pa. The property comprises about 10 acres of land, with one main manufacturing building, 100 x 220 ft., a power plant building, a two-story concrete office building and a warehouse. The purchased works formerly turned out boilers and other plate products, and a slight rearrangement of the equipment will enable the Blaw Company to manufacture its collapsible steel centers or forms for concrete sewers, mine shafts, &c., to advantage. The company for years has operated a plant at Rankin, Pa., but the new factory will eventually be the larger and more important.

## The Valley City Combination Disk, Surface and Tool Grinder.

To the already large class of combination grinders of one kind and another, the Valley City Machine Works, Grand Rapids, Mich., has just added another which is unique in its combination of functions. As viewed in the illustration, the right end of the spindle carries a metal disk wheel, to which disks of emery paper can be attached after the manner of the familiar disk grinder. The table serving the disk will tilt to any angle from 0 to 45 degrees, and, although not so shown, the disk side may also be furnished with a rocking table, particularly desirable for machine shop use, and for polishing all kinds of metals. The tables of both the disk and surface grinding sides are equipped with rapid-acting adjusting screws. The first has two adjustments, in-and-out, as well as vertical, while the surface grinding table has only vertical adjustment, but at two points. That for the upper table can be




A Combination Disk, Surface and Tool Grinder Built by the Valley City Machine Works, Grand Rapids, Mich.

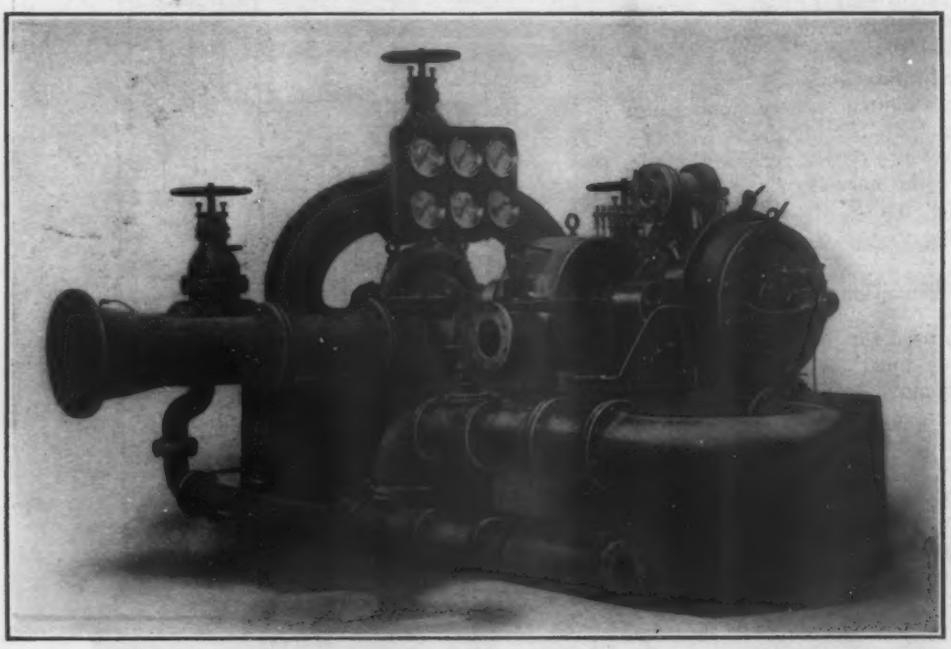
made with micrometer accuracy, and has an independent range of movement of 6 in. This table is 20 x 8 in. in area. Above it is the rest for tool grinding. The grinding wheel is 10 in. in diameter by 1½-in. face. The disk table is 18 x 10 in. in area and the diameter of the disk is 18 in. The frame is a single casting of rather heavy section to avoid vibration. The machine is suitable for all kinds of tool and surface grinding, and especially for the use of pattern and die makers. With it is furnished a countershaft intended to run at 500 rev. per min., at which speed the machine arbor would run at 1500 rev. per min.

The Delaware River Iron Shipbuilding & Engine Works, Chester, Pa., more familiarly known as Roach's Shipyard, comprising about 37 acres of ground, with buildings and machinery, was sold at receiver's sale March 24 for $51,100, subject to a mortgage of $100,000 and interest. William Holman of New York was the purchaser. The court of Delaware County has approved the sale, although exceptions may be filed up to April 2.

# A De Laval Steam Turbine Pumping Engine.

## A Compact Self-Contained Unit of Large Capacity.

The possibility of combining a centrifugal pump and a steam turbine to form a pumping engine comparing favorably with reciprocating units as regards size, cost, simplicity and steam consumption has been suggested to engineers as a natural consequence of the improvements made in the two during recent years. From the standpoint of steam economy, the turbine now ranks with the steam engine and the efficiency of the turbine pump is as good, if not better, than that of the reciprocating type, particularly if the efficiency for the entire year is considered. In the reciprocating pump, leakage or slippage and the frictional resistance of the glands, packings and gears frequently cause a great waste of power, while there are no rubbing parts, joints or packing in the centrifugal pump, except around the shaft, and the turbine has fewer parts and requires less attention than a reciprocating engine.



A Self-Contained Pumping Unit Consisting of a Steam Turbine and Two Centrifugal Pumps, Built by the De Laval Steam Turbine Company, Trenton, N. J.

The steam turbine-driven centrifugal pump also invites attention from another point of view. There are many services where a pump is required to work against more than one pressure and this requirement is easily met with good steam economy by a turbine-driven multi-stage centrifugal pump properly arranged for series and parallel operation. One such service is for municipal and industrial plant water supply, where the water is wanted under one head for service conditions and under a higher head for fire purposes. Such a pump in pumping out mines at first will handle a large amount of water against a comparatively low head, and later it can be operated efficiently against the higher head, handling the smaller volume of water due to infiltration when the mine is cleared.

These conditions, it is stated, are not met satisfactorily by the reciprocating unit. One method used in water works plants, which, however, results in poor steam economy, is to admit high-pressure steam to the low-pressure cylinder whenever a higher water pressure is required. A reciprocating pump may also be operated with low-pressure steam by throttling the steam supply, which is inadvisable from an economic viewpoint. The increased pressure may be taken care of by changing the cut-off of crank and flywheel pumps, but any considerable change secured in this way also has a detrimental effect on the efficiency.

The centrifugal pump, however, is adapted to meet these operating conditions. The pumping unit shown in the accompanying illustration was built by the De Laval Steam Turbine Company, Trenton, N. J., and consists of two 10-in. De Laval double-suction centrifugal pumps, driven by a De Laval steam turbine. The piping and valves are so arranged that the pumps can be operated either in parallel or in series, covering a range of operation from a normal delivery of 7550 gal. per min., against a head of 50 ft., to 2100 gal. per min., against a head of 175 ft. The pumps are operated in parallel up to 80 ft., while for higher heads the range is covered by the two pumps operated in series.

The duty secured compares very favorably with that of a crank and flywheel pumping engine of the same capacity, equipped with riding cut-off valve, and is superior to that of compound or triple-expansion direct-acting pumps. The steam turbine of this unit was designated to operate with steam at 100-lb. pressure, exhausting into a 27-in. vacuum, and a test of the complete unit under these conditions showed a duty of 81,000,000 ft.-lb. per 1000 lb. of dry steam consumed by the turbine, while the pumps delivered 2500 gal. per min., against a head of 150 ft., and the same duty was also obtained when delivering 2100 gal. against 175 ft. When delivering 2800 gal. against 110 ft. the duty was 73,000,000 ft.-lb. By raising the steam pressure to 150 lb., with the same vacuum, the above duties can be increased to 87,000,000 and 78,000,000 ft.-lb. respectively.

These high duties are maintained throughout a wide range of delivery, moreover, since both the De Laval steam turbine and the De Laval centrifugal pump have very flat efficiency curves. In the case of the former, this is because the same expansion of the steam is obtained at all loads, by closing down or turning on nozzles, and all in action can be operated with the expansion for which they were designed, a feature peculiar to a few types of turbines. The high efficiency of the De Laval pump through a wide range of load is due to its design. One feature which helps to make possible the maintenance of high efficiency over a wide range is the absence of diffusion vanes, which it is claimed can be correctly shaped for only one load. Pumping units of this character are often compelled to operate under widely varying conditions of delivery, and, in fact, are rarely operated at the nominal delivery rate much of the time, so that this feature is highly important. The good efficiency of both parts of the unit, it is stated, is retained indefinitely because the steam efficiency of the turbine is not affected by wear of valves or piston rings, and the pump is also free from leakage and slippage losses.

The outfit is quite compact, as will be noticed from the engraving, and the pump, turbine and condenser are all mounted on a box bed-plate of moderate size. The condenser is of the ejector type and receives the injection water under considerable head from the first

pump, thus making a good vacuum possible with simple and inexpensive apparatus. If it is desired to shut off the condenser at any time, the unit can be operated non-condensing by closing the water check valve in the exhaust pipe, upon which the steam will escape through the exhaust relief valve.

A speed limiting device consisting of a butterfly valve in the exhaust pipe normally held open by a spring, but controlled by a piston, prevents the turbine from running away in case of failure of the main governing valve to operate, due to leakage when the turbine is lightly loaded. If the speed of the turbine exceeds a certain predetermined limit a governor on one of the gear shafts will open a valve, admitting air behind the piston, which will then turn the butterfly valve to a position athwart the exhaust steam pipe. As soon as the speed is reduced, air will leak from the cylinder into the exhaust pipe, and the valve will resume its normal position. As will be seen, the action of this device is entirely independent of the ordinary governor-controlled speed-regulating valve in the steam supply line. When a constant excess of water pressure is desired, an ordinary pump governor can be installed in the steam line, in which case the main governor serves merely as a speed controller.

All gauges have been mounted on a common gauge board attached to the piping connecting the two pumps. These show the steam pressure on the turbine throttle, the steam pressure above the nozzles, the water pressure in the pipe lines, the suction lift, the water pressure in the injection pipe to the condenser, and the vacuum.

Lubrication is furnished from a central multiple oiler mounted on the gear case of the turbine, and the oil from this lubricator is used for the high-speed bearings, gears and governor pins. All oil from these points is carried to a common reservoir in the bed plate, and pumped from there by separate pumps to a filter mounted on the wall, from which it flows back to the central oiler. The oil pump is fastened to the side of the base plate, or may be set at some convenient place in the engine room. All the low-speed bearings are ring-oiled and have separate reservoirs.

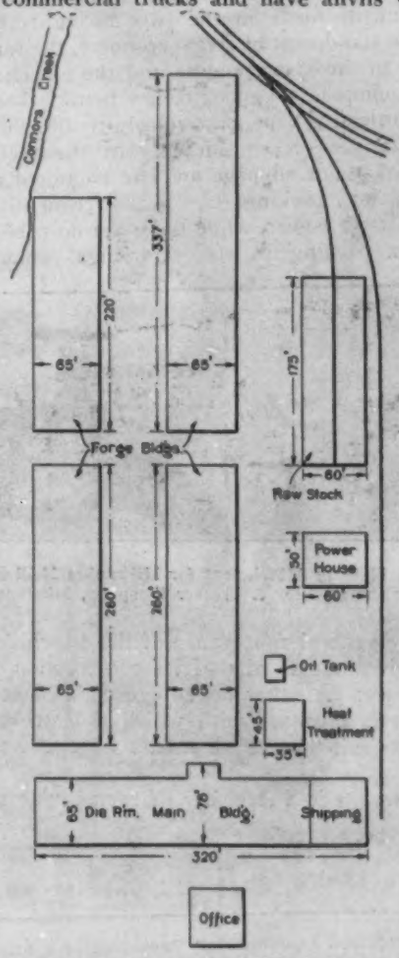
The unit is very compact and completely self contained, so that the purchaser has only to make the steam and water-piping connections and set the machine upon a suitable foundation. The latter may be comparatively light, as there is no vibration, it is claimed, and consequently not even holding-down bolts are required, except to resist piping thrusts, which should be avoided as far as possible.

## The Anderson Forge & Machine Company's New Plant.

The remarkable development of the past few years in the manufacture of automobiles, gasoline engines and machinery has created an increased demand for drop forgings of all kinds. To keep up with this demand the Anderson Forge & Machine Company, Detroit, Mich., has gradually increased the capacity of its present plant at the foot of St. Aubin avenue until the average amount of steel handled per month is 1,000,000 lb. and every available corner has been filled. Recently the company purchased a 13-acre tract on the line of the Detroit Terminal Railroad, where a new and modern plant will be built, following the plan given herewith. It will probably be the largest drop forging plant in the country and is expected to be completed by about the middle of July.

Nine buildings will be erected, all but one of which will be concrete, and a mile of industrial track will be laid for handling the raw material and finished product. The office building will be brick, 50 x 50 ft., two stories high. The main building, which will be devoted to die making, will be 65 x 320 ft. and two stories high. This building, in addition to a full equipment of industrial track, will be served by five traveling cranes.

For the forge department there will be four buildings, two 65 x 260 ft., one 65 x 337 ft., and the fourth 65 x 220 ft. The first forge building will be completed as soon as possible. The initial installation in the steam forge department will include a battery of 30 steam drop hammers, requiring 1200 hp. to operate them. The two largest of these will be capable of forging complete in one piece the front axles of the heaviest commercial trucks and have anvils weighing




Plan of the New Works of the Anderson Forge & Machine Company at Detroit, Mich.

100 tons each. In this shop two traveling cranes of sufficient capacity to dismantle any piece of machinery for repairs will be installed. These will also be used for placing the larger sized dies, some of which weigh five tons, in position in the large hammers.

Water tube boilers will be used, operated at 200-lb. pressure, and located in a separate power plant building. Oil will be used for fuel throughout the plant and the oil, air and steam pipes will be carried in specially designed concrete tunnels, which will permit of easily reaching any part of the system for repairs or extensions. Air at low pressure for vaporizing the oil at the burners will be carried in spiral riveted pipe.

In addition to the forging equipment, one of the most modern and complete heat treatment departments will be installed. It will be equipped with the latest furnaces and oil baths, all connected with pyrometers, to obtain the most accurate results possible. This department was found necessary, as the company is making large quantities of forgings from the various grades of special alloy steels now being used in automobile construction, and these require very exact and particular heat treatment to yield the best results.

Two 10,000-gal. storage tanks will be built to hold the supply of fuel oil for the boilers and the tempering and annealing furnaces. This will be enough to last about one week, as the consumption averages 3000 gal. of fuel oil per working day of 10 hours.

## The Milwaukee Miller Slotting Attachment.

A slotting attachment can be used to better advantage on a toolroom milling machine for slotting boring bars, dies and wrenches and cutting keyseats than the ordinary milling cutter. For this reason the Kearney & Trecker Company, Milwaukee, Wis., has brought out a new slotting attachment for use in connection with its Milwaukee milling machine. Fig. 1

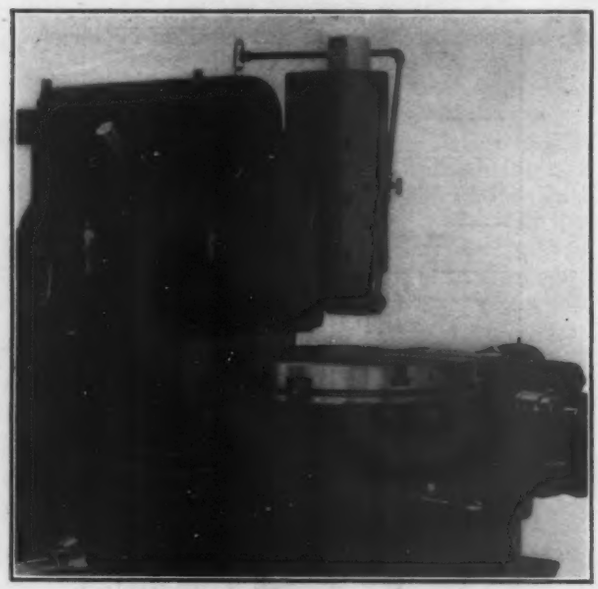


Fig. 1.—A Slotting Attachment for Milwaukee Milling Machines Made by the Kearney & Trecker Company, Milwaukee, Wis.

shows the general appearance of the attachment, while Fig. 2 gives the details of its construction, which is very simple. Another advantage claimed for the attachment is the ease with which the stroke may be varied to suit the requirements of the work being handled.

The ram *a* is a steel bar of rectangular cross section and is furnished at its lower end with hardened V-jaws, *bb'*, in which the slotting tool is held by clamps. These jaws are provided with a hardened piece, *c*, to back up the tool *d*, which may be of any desired size and shape. The advantages of this construction are that any shape of rough or finished tool between ¼ and ¾ in. can be used, which, it is stated, could not be done where the tool was held in a round hole by a set screw. This feature enables the machine to be used with special tools that can be quickly improvised instead of waiting for them to be turned and finished to fit a round hole. The form of the ram is also advantageous, as the bearing is very long as compared with its width, and as a result stiffness and a better alignment are secured.

The return stroke is made at twice the speed of the cutting stroke, which considerably increases the output. This quick return is effected through the driving shaft *e*, which has an adjustment bolt, *f*, sliding in a T-slot cut through the front end of the shaft. An opening is provided on the right side for adjusting this bolt with a wrench and in that way varying the stroke from 0 to 4 in. The ram can be swiveled through the entire circumference of a circle, so that it is possible to hold work in the chuck on the dividing head in a horizontal position and take cuts. In this way the head can be used for indexing such work as a hexagonal socket wrench, internal gears or anything else of this character that cannot be done in any other way with accuracy.

A groove, *g*, is cut in the driving shaft, and a bronze block, *h*, is fitted therein. This block is driven by the collar *i*, which is mounted directly on the main spindle of the machine, and there is sufficient distance between the center lines of the driving shaft and the spindle *j* to give the quick return of two to one.

The distance from the face of the column to the cutting tool is sufficient to reach the center of the rotary table when work requiring slotting and indexing is being done. If the rotary table is not available the attachment can be swiveled to a horizontal position and used in connection with the maker's universal centers.

All of the Milwaukee milling machines are constructed with the knee slide carried upward to the over arm. The primary purpose of this construction is to provide a means for holding the different attachments for the machine securely in place. To make it possible to set the ram to work in any direction the casting carrying it is graduated in degrees with reference to the zero line on the base clamped to the knee slide. The oil tubes employed for conveying the lubricant to the cutting edges are of the maker's standard design, which was described in *The Iron Age* July 30, 1908, in connection with an illustrated description of the high power miller built by this firm.

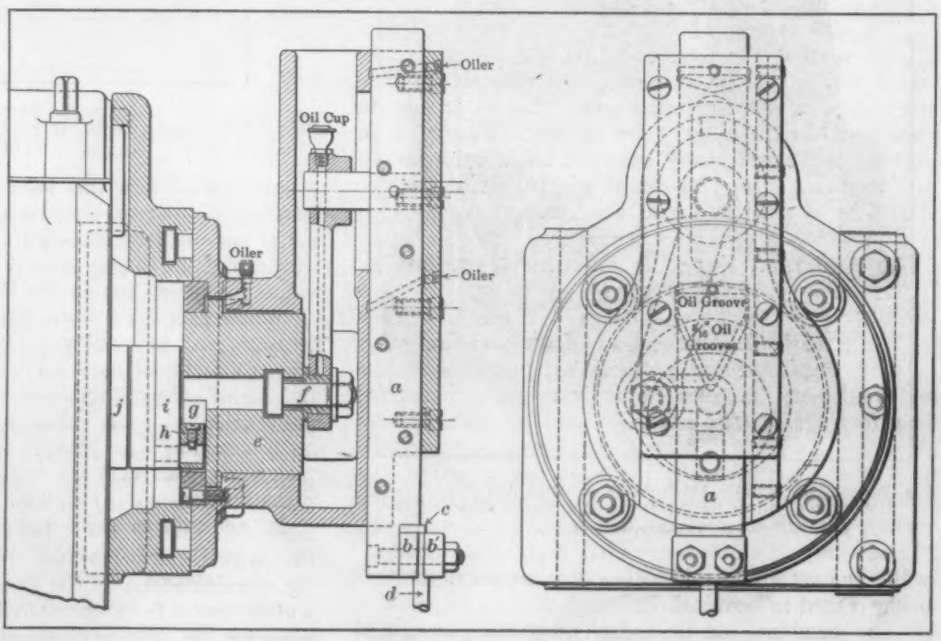



Fig. 2.—Details of the Milwaukee Miller Slotting Attachment.

The patternmakers in the job shops in Cleveland have asked for an advance in their minimum wages from 40 to 45 cents an hour and a union agreement with their employers.

The National Metal Trades Association meets at the Hotel Astor, New York, April 13 and 14. The premium system will be given prominent consideration.

## The New Beaman & Smith Automobile Cylinder Boring Machine.

Boring automobile cylinders in a vertical position possesses the advantages of eliminating the overhang of the heavy cutters and causing the chips to fall away from the cutters instead of wedging under the cutting edge and interfering with the operation. In this position, the work can be held more firmly and inspected with greater rapidity, which is also advantageous. The Beaman & Smith Company, Providence, R. I., has recently built the vertical two-spindle machine for boring cylinders of automobile engines shown in Fig. 1, which is a general view of the machine, while Fig. 2 illustrates the details of the spindle construction, which is somewhat novel.

The machine is suitable for boring cylinders, whether they are cast singly, in pairs or *en bloc*. When the cylinders are cast in pairs, one in each of the two castings is bored at the same time. When the cut is finished, the table is shifted horizontally a distance equal to the space between the centers of the cylinders of each casting and the second one bored. The boring operation is practically a continuous one, as,

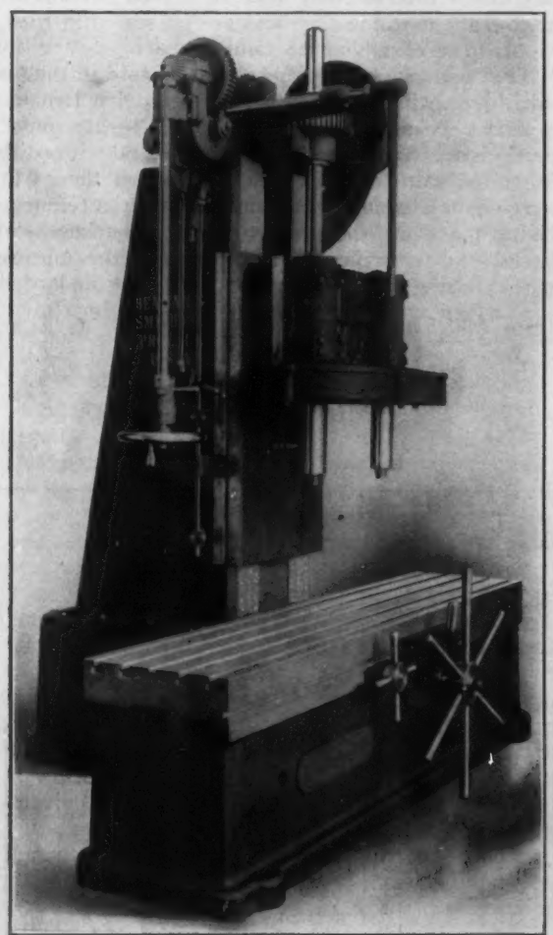


Fig. 1.—A Two-Spindle Machine for Boring Automobile Engine Cylinders, Built by the Beaman & Smith Company, Providence, R. I.

while one set of castings is being machined, another is being placed in position.

The machine consists of a substantial bed, upon which a work table 20 in. wide and 6 ft. long, provided with hand wheel adjustment, is mounted. An upright supporting a saddle is also mounted on the bed. This saddle carries the two boring spindles, and is provided with a down feed for boring and a quick power movement for taking the spindle out of the work after the cut is completed.

As will be noted from Fig. 2, the spindle proper revolves around a stationary center, or spindle stud, *a*, one end of which is held firmly in a head, *b*. The stud is of high carbon steel, so that it may be as stiff as possible. The cutting tools are attached to the lower end of the spindle by the screw threads, *f*, and simultaneously with the latter portion of the boring operation the upper end of the cylinder is chamfered by the tool *g*, which is attached to the adjustable split collar, *c*, and comes into action when the bore is nearly finished. In this way the cutting points of the tools are supported very close to where the work is being performed

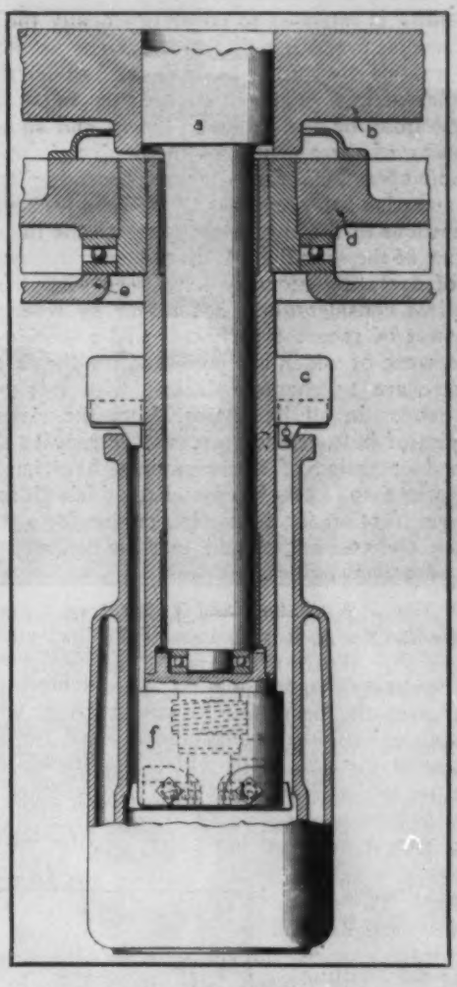



Fig. 2.—Detail of the Spindle, Showing a Cylinder in Position for Boring.

and the pressure of the cut is taken by a ball bearing and the weight of the spindle. The manufacturer states that such a construction approaches very nearly to the theoretically ideal type for producing a perfectly true cylinder.

The machine is driven by the three-step pulley, shown at the right of Fig. 1, and this power is transmitted through double gears to a driving shaft, which in turn drives the spindle through gears *d*, Fig. 2. These spindle driving gears are protected by the shield *e*. One advantage claimed for this type of construction is that gears of large diameters may be used for driving the spindle, and that the spindles and stud can readily be made of a size that will best meet the requirements of the work to be performed. The reversal of the spindle is accomplishd by the lever hanging down in front, and to one side of the spindle heads, and the adjustment for the saddle is controlled by the hand wheel at the left side of the machine which operates through gears.

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The new 18-in. billet and sheet bar mill of the Cambria Steel Company, Johnstown, Pa., was put in operation March 18.

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The first cast at the new pipe foundry of James B. Clow & Sons, Coshocton, Ohio, was poured March 17.

## New Publications.

**The Steam Engine.**—By Charles H. Benjamin, M. E., D. Eng. Size 6 x 9 in.; 316 pages; 198 illustrations. Bound in cloth. Price, $3. Published by the Technical Press, Brattleboro, Vt.

This book is designed primarily for a textbook rather than a reference book for engineers. While the treatise is intended to cover practically the whole list of subjects relating to the steam engine concisely in one volume, the author has explained the elementary principles of heat engines, so that they might readily be understood by the average student and shown the application of these principles in the design, construction and operation of modern reciprocating engines. More attention has been paid to practical problems and the questions of the engine user than to the theoretical problems of the scientist. With this end in view, questions of operating economy have been settled, not by theoretical considerations, but rather by referring to the results of recent experiments under working conditions, some of which are published for the first time.

There are 14 chapters dealing with this type of prime mover in all its phases, from the elementary principles of heat, temperature and entropy to the design and operation of steam engines. A chapter on specifications and costs is appended, which gives a detailed specification for a pumping engine for a municipal plant and cost curves and data for condensing and non-condensing engines.

**Handy Man's Workshop and Laboratory.**—Compiled and edited by A. Russell Bond. Size 5¾ x 8¼ in.; pages 467; illustrations 370. Cloth bound. Price $2. Published by Munn & Co., Inc.

Some time ago *The Scientific American* started a department devoted to the interests of the handy man. The best of the suggestions sent in for use in this department are included in the present book and a large number added which have never before been published.

The book is divided into nine chapters. The first is preliminary and deals with building and fitting up a workshop. The second is entitled "Shop Kinks" and tells, for example, how to cut threads without a die, how to make a spaced coil spring, what substitutes may be used for a pipe wrench, how to saw holes in metal, and a number of other useful things. Chapter III. is concerned with the soldering of metals and the preparation of solder and soldering agents, and the next one gives a series of emergency uses of the lathe, milling machine and other apparatus found in machine shops. The next two divisions are given over to laboratory experiments and apparatus. The seventh chapter has to do with the handy man about the house, and the last two deal with sporting subjects.

The illustrations are chiefly in the form of working drawings that show how the work is done and why, and an alphabetical index and one of the authors of the different suggestions are appended. Altogether the book is one which will be of very great interest to any mechanic, be he amateur or professional.

**The Elements of Machine Design.**—By William Cawthorne Unwin, LL.D., F.R.S. Bound in cloth. Size, 6 x 9 in.; 531 pages; 387 illustrations. Price, $2.50. Published by Longmans, Green & Co., 91 Fifth avenue, New York City.

This book is one of the "Text-Books of Science" series, published by this company, and is a new and revised edition of Part I. of the author's standard work covering general principles; strength of materials; rivets, bolts and other fastenings; journals and shafting; couplings; pedestals, and transmission of power by gearing, belting, ropes and chains. This treatise was originally intended to occupy a distinct field between works on applied mechanics and empirical books of rules and collections of examples of machine details. Scientific rules applicable to the design of machines are given, as well as standard proportions and examples of details and empirical rules for cases which cannot be handled in any other way. A great part of the work, however, is a discussion of the different considerations which should be present in the mind of the designer in applying scientific principles, and those which limit the reliance upon purely practical experience.

Various new theoretical and experimental investigations are mentioned and some effort is made to clear up the ambiguity resulting from the application of the same term to the forces acting on a structure and the deformations which are produced by it.

**Engine Lathe Work.**—By Fred H. Colvin. Cloth bound. Size, 4½ x 7 in.; pages, 180; illustrations, 127. Price, $1. Published by the Hill Publishing Company, 505 Pearl street, New York City.

This book contains a large number of practical suggestions which will give the young machinist or apprentice the foundation principles of engine lathe work which must be understood in order to get the best results. While there is nothing startlingly new in the suggestions offered, they represent good practice for the average machine shop and are presented in such a way as to be clear and practical.

The volume is divided into 14 chapters, each of which deals with some feature of the engine lathe and its work. These are arranged in logical order, from a description of the lathe itself to examples of good engine lathe work and the care of the machine. The intermediate chapters cover subjects such as centering, driving the work, tools and turning, face plate work, chucks and chucking, boring tools, taper turning, thread cutting, and indicators and their use.

**Steam Tables and Diagrams.**—By Lionel S. Marks and Harvey N. Davis. Bound in cloth. Size, 6½ x 9¼ in.; 106 pages. Price, $1, net. Published by Longmans, Green & Co., 91 Fifth avenue, New York City.

The tables of the properties of saturated steam which have appeared up to the present have all been based upon the investigations of Regnault carried out more than 60 years ago, and for some time it has been apparent that the total heats of dry and saturated steam therein determined are below the correct values. These errors are probably due to the great difficulty of obtaining entirely dry saturated steam, and it is probable that Regnault was investigating steam containing a small amount of moisture when he thought he was dealing with dry steam. Recent investigations have, however, given trustworthy new values of the total heat of dry steam at pressures both below and above that of the atmosphere, and the table given in this book is based entirely upon these new values. It is probably correct to within 1-10 of 1 per cent. for the range of steam pressures encountered in ordinary engineering practice.

The properties of superheated steam are tabulated for every pound of pressure and for every 10 degrees of superheat within a range which exceeds present practice, and as all the information relating to superheated steam of any pressure is given on one double page, the immediate finding of any desired quantity is possible. Supplementary tables extend the superheated steam tables to very high temperatures and give the properties of water, conversion factors, Naperian logarithms, and other quantities. In addition to the tables two large diagrams have been prepared, showing the properties of saturated and superheated steam. These diagrams can be used instead of the tables for finding the total heat, entropy and the specific volume of steam of any known quality or superheat, but their chief purpose is to facilitate certain calculations. The use of these two diagrams, either separately or in combination, will enable a large number of problems oc-

curring in the design of engines and turbines, or in connection with the flow of steam, or its throttling, to be solved without any calculation.

The book is divided into three parts. The first contains the tables and diagrams, the second is devoted to a general discussion of the use of the diagrams, and the third is given to a discussion of the sources of the experimental data used in the computation of the tables.

**Internal Combustion Engines.**—By William M. Hogle. Size 6 x 9 in.; pages 256; illustrations 106. Bound in cloth. Price $3 net. Published by McGraw Publishing Company, 239 West Thirty-ninth street, New York City.

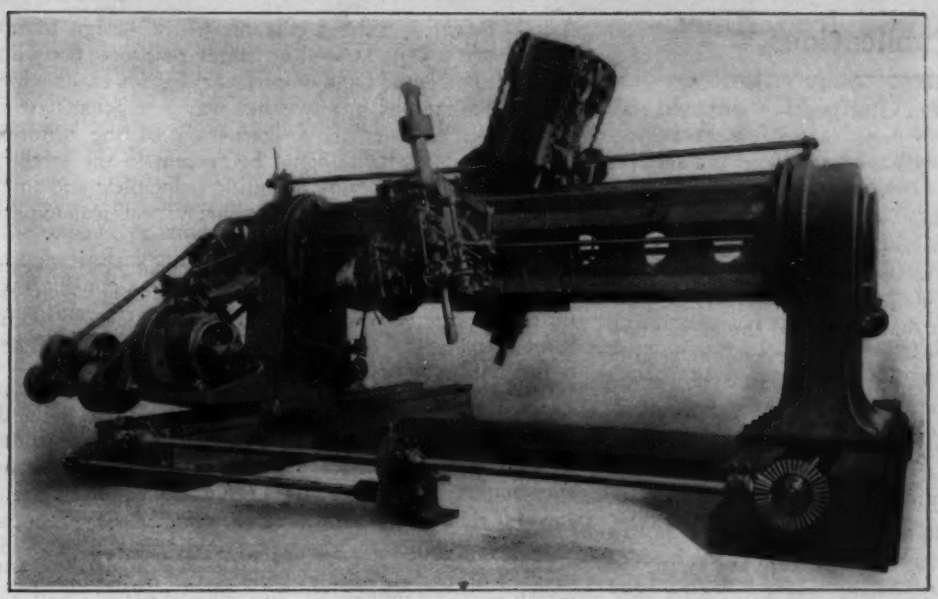
This is intended as a reference book for designers, operators, engineers and students, and it has been the aim of the author to eliminate as far as practicable the more involved mathematical formulæ and to confine the subject matter to the more practical and applied phase. Where necessary, however, to illustrate the subject matter, formulæ have been employed. In the matter of design average practice has been considered.

Following a historical introduction, the first four chapters deal with the different cycles and a comparison of their advantages. Chapter V. covers the practical operation of the engines, and chapters VI. and VII. are concerned with starting devices and carburettors, vaporizers and injectors, respectively. The next two chapters deal with producers and fuels and combustion and are followed by chapters on compression and the indicator card. Chapters XII. to XXI., inclusive, take up the design of the internal combustion engine, a chapter being devoted to each of the principal parts. Chapter XXII. gives a description of the methods employed for testing engines, and this is supplemented in the final chapter by instructions for reporting on a test and the preparation of the results. There is a miscellaneous chapter, containing a number of tables of general interest.

## The Schiess Combined Slotting and Drilling Machine.

BY AUGUST F. BOCK, BERLIN.

A heavy combined slotting and drilling machine, constructed at the Ernst Schiess Works, Dusseldorf, Germany, is illustrated herewith. As will be noticed, the machine consists of two heavy bed-slides bolted down to the foundations and each provided with a traveling standard. The two standards are connected



A Combined Slotting and Drilling Machine Built by the Ernst Schiess Works, Dusseldorf, Germany.

together at top by a cross slide, which can be turned on its horizontal axis through an angle of 70 degrees on either side of the normal vertical position; by this means the tool on either side can be inclined about 55 degrees to the table. The cross slide carries a boring head on front side in the illustration and a slotting head on the other. The two bed-slides are connected together by a bed-plate. The slotting head is operated by a 5½-in. screw, fitted with an adjustable brass nut.

The machine is driven by a 300-volt motor, carried on one of the standards, as shown. It operates the lead screw by gears and open and crossed belts. A balancing flywheel is supplied when the loads vary frequently.

The machine as illustrated is designed for cutting speeds of 6 ft. 6 in., 13 ft., and 16 ft. 4 in. per minute. The belt shifter for taking a cut and for the return is independent of the gear device for operating the slotting head, and for the traveling of the standards on their slides, a special gear being provided for the latter. Both the standards and the slotting head are rapidly operated mechanically, but their working position can also be adjusted by hand; that of the slotter at the head itself and that of the standards at one end of the slides. The slotting ram works on a slide of girder section, and is balanced by a lead counterweight. The slide is mounted on a turntable, which allows it to swivel through 20 degrees on either side of the vertical.

The boring head is on the front of the heavy cross slide and is operated by a separate motor and consists of a slide on which a boring bar support can swivel by a rack and pinion gear. The bar is of forged steel, and is operated by rack and pinion gear. The return is by a reversing gear, and the machine is also adaptable for screw cutting. The boring bar is balanced and is operated by the small motor carried on the slide through a three-step pulley and two-wheel devices; thus having six different cutting speeds. The boring bar support can swivel through 30 degrees on either side of the vertical. The boring slide is rapidly set mechanically and its position can be adjusted by hand.

The following table gives the principal dimensions and specifications for the machine:

| | |
|---|---|
| Length of bed slides, feet and inches | 25 3 |
| Space between standards, feet | 17 |
| Length of bed plate, feet and inches | 16 5 |
| Depth of bed plate, feet and inches | 8 3 |
| Distance between bed plate and heads, feet and inches | 5 7 |
| Vertical travel of slotting slide, feet and inches | 3 ½ |
| Vertical travel of slotting ram, feet and inches | 3 11 |
| Minimum distance between slotting ram and table, in. | 20½ |
| Diameter of boring bar, inches | 4 31/32 |
| Travel of boring bar, inches | 27½ |
| Size of main motor, horsepower | 35 |
| Speed of main motor, revolutions per minute | 720 |
| Size of boring motor, horsepower | 10 |
| Speed of boring motor, revolutions per minute | 800 |
| Number of cutting speeds | 3 |
| Weight of machine, tons | 103 |

All the wheels and pinions which are subject to much wear are of steel and the bearings of all high-speed shafts are made of brass.

# Jones & Laughlin Iron Mines.

## The Company's Latest Acquisition on the Mesaba Range.

DULUTH, MINN., March 26, 1910.—By the acquisition of the Nassau property the Jones & Laughlin interests of Pittsburgh have made another important addition to their Mesaba range holdings. The Nassau is located 1 mile east of Hibbing. It is listed by the State Tax Commission as containing 4,000,000 tons of ore. Adjoining it is the Longyear property, containing 3,000,000 tons and which is also owned by the Jones & Laughlin Steel Company. It is expected that both tracts will be extensively stripped this year and thereafter wrought jointly as an open pit mine. The Nassau, one of the Pittsburgh Iron Ore Company's group, was partly opened three years ago, but to date has produced only 30,000 tons. The Longyear has sent out 125,000 tons. The Jones & Laughlin Steel Company operates a number of mines on the Mesaba range. It has besides considerable deposits as yet undeveloped, notably in the Lake Embarrass District. Its properties include the Lincoln and Columbia mines at Virginia, the Meadow and Fowler at Aurora, the Grant at Buhl and the Leetonia at Hibbing.

Important stripping operations are in progress at the Grant mine. Altogether 5,000,000 cu. yd. of surface material will be removed, of which about one-fifth has already been handled. It was at the Grant that the attempt was made to strip the overburden by means of clamshell buckets operated on cables stretched across the property. The conditions on the Mesaba range proved unfavorable and the experiment was abandoned after much money had been expended and the development of the mine had been much delayed.

The Leetonia, 2 miles west of Hibbing, was the largest of all the Jones & Laughlin producers last year, its output exceeding 550,000 tons. The mine was opened as an open pit and has been chiefly worked by that process, but there is one shaft, and in that portion of the property operations are conducted throughout the year. The shaft is served by an electrical hoist. The Meadow and Fowler are underground mines and they employ an average of 175 men. The Fowler has been producing the past three years. The Meadow is not yet on the shipping list.

### Jones & Laughlin Mines on Other Ranges.

While the principal Jones & Laughlin holdings are on the Mesaba range, the company has important interests elsewhere. Its Lake Angeline mine at Ishpeming has long been one of the largest producers on the Marquette range. To date it has sent out more than 8,000,000 tons. Naturally, the deposits are by no means as extensive as they once were, but the Lake Angeline will be in commission for many years yet. Its ore is of high grade and it is not drawn upon as heavily as could be. The shipments last year, however, approximated 300,000 tons. At Negaunee, Marquette range, the Jones & Laughlin interests are developing the Rolling Mill mine, which last year sent out 130,000 tons. The ore at the Rolling Mill was found at a depth of 600 ft. by diamond drilling a few years ago. The deposit is of important dimensions and the mine is already a fine proposition. The Jones & Laughlin Company has a number of properties under option at the western end of the Menominee range, and these it is exploring with excellent results. Considerable ore has already been found and at the present time the opening of two mines is practically assured. The company also has holdings on the Gogebic range and in the new Cuyuna district of Minnesota. The value of these tracts is, however, still to be determined.

### Transportation Interests.

Jointly with the Cleveland-Cliffs Iron Company and through the subsidiary Pittsburgh & Lake Angeline Company, the Jones & Laughlin Company is interested in the Lake Superior & Ishpeming Railway, a line 19 miles in length, extending from Ishpeming to the port of Marquette, where it has an ore dock and a coal dock. The railroad was built some 15 years ago, at a cost of $3,500,000, exclusively for the purpose of transporting ore from the mines and hauling coal to them. The line is now operated in conjunction with the Cleveland-Cliffs Company's own system of railroads, comprising the Marquette & Southeastern and the Munising, and aside from the ore and coal triffic it does a considerable passenger and general freight business. This spring the Lake Superior & Ishpeming will be extended to the new North Lake District, west of Ishpeming. A new 600-ft. steel freighter now being built by the American Shipbuilding Company will be added to the Jones & Laughlin fleet this season, and one of the same capacity will go into commission next year, a contract for its construction having recently been awarded to the Great Lakes Engineering Works of Detroit.

### Consumers' Ore Company Connections.

The Pittsburgh Iron Ore Company, from which the Nassau mine was acquired, was organized four years ago. Through its various subsidiaries it controls four mines on the Mesaba range. The LaRue, at Nashwauk, and the Croxton, at Chisholm, were developed a number of years ago. The LaRue sent out 365,000 tons and the Croxton 160,000 tons last season. The Croxton is operated by means of a shaft and an open pit, and the LaRue is a straight open pit proposition. The Brunt, at Mountain Iron, and the Hobart, at Gilbert, are mines which are not yet fully developed. Jointly with the Virginia Ore Mining Company and the Hobart Ore Company, the Pittsburgh Iron Ore Company will shortly occupy new offices at Virginia, where a fine building for that purpose is now nearing completion. All three concerns are affiliated with the Consumers' Ore Company of Cleveland. This latter corporation is one in which a number of blast furnace companies are interested. These constituent organizations are the consumers of the product of its mines, and one of them, M. A. Hanna & Co., has general supervision of the mining and shipping operations. This arrangement enables the consumers to obtain the raw material at a minimum expense and is advantageous to all concerned.

The Consumers' Company itself began active operations in 1904, at which time it leased the Frantz mine at Buhl. The property had previously been explored and opened as an underground proposition. It was operated for a number of seasons until 1905, since which time it has been inactive, its ore being held in reserve. The same season that it acquired the Frantz mine the Consumers' Company explored and opened the Yates in the same district. This mine has since yielded 700,000 tons of ore and is now practically exhausted. In 1907 the company began stripping the Hanna mine at Mountain Iron. An open pit of considerable extent has now been excavated and last season there was shipped from it 240,000 tons of ore. A considerably increased production will be made this year.

The subsidiary Virginia Ore Company operates the Sliver mine, so called because of the peculiar shape of the tract. It is a long, narrow strip, terminating in a narrow point. Stripping has been in progress since 1908 and it will continue for a number of years yet. The overburden averages 40 ft.

### The Cambria Steel Company's New Property.

The Cambria Steel Company has increased its Lake Superior holdings by the purchase of the West Republic property. The tract has been acquired from the Wright Iron Company, controlled by O. S. Bond of Toledo, Ohio, and associates. The property adjoins the Cambria Company's Republic mine in the western portion of the Marquette range, and it has been under

lease to the Cambria interests for a long time past. It is partly opened by one shaft, which is down 800 ft. The West Republic was on the shipping list prior to 1898 and, all told, its production has amounted to only 130,000 tons. Considerable exploratory work has been done by the Cambria Company and it is understood to have indicated that the deposit is of no small proportions.

## Gary Building Trades Unions.

### High Building Costs Result of Labor Restrictions.

Building operations in the city of Gary, Ind., afford an unusually favorable opportunity to compare the cost of labor in the building trades, under closed shop conditions, with the cost in other cities where the workingmen do not by organized effort endeavor to make the job last by restricting the amount of work which a man may perform in a day. The contractors who are building homes and stores at Gary come from all parts of the country and have had experience with every degree of union restrictions in building operations, some of them coming from Chicago, some from other cities in Indiana and some from other States. The new city, where the United States Steel Corporation is establishing the greatest steel plant in the world, is attracting enterprising men to share in its growth and prosperity and thus brings to a center the experience of the entire country in building operations.

#### How Much Is Added to the Usual Cost.

It is estimated that union restrictions at Gary add all the way from $250 to $1000 to the ordinary cost of a workingman's home. This brings to light tangible data on a subject that has not been given the attention it should receive from experts on modern industrial conditions. It shows what the extreme development of unionism costs the workingman himself; the tribute which a worker in the steel mills must pay to those who in the building trades are working contrary to the natural development of industrial economy.

On the cheapest kind of a home, such as a common laborer would buy or rent, the increased cost is estimated at $250. On a story and a half cottage of five or six rooms, with water, gas and a cheap bathroom, the increased cost is estimated at $350. On a good, comfortable home, such as a skilled workman could afford to buy or rent, with a furnace, good plumbing and other modern improvements, the additional cost growing out of union restrictions is estimated at $1000 by contractors of wide experience.

#### Due Not to the Wage Scale But to Restrictions.

It is not the scale of wages that fixes the cost, but rather the restrictions on the amount of work that a man may do for his daily wages. Careful inquiry among contractors fails to develop any complaint against the rate of wages. Bricklayers and plumbers are paid 65 cents an hour, carpenters and painters 56¼ cents and other trades in proportion. The men work 8 hours a day in all the trades, with a half day off on Saturday, making 44 hours per week, except in the case of the bricklayers, who work 48 hours. These wages are undoubtedly high for a city the size of Gary, being equal in most cases to the scale paid in Chicago. The rate, however, is not objected to by contractors, who as a rule are not seriously concerned regarding the wages they pay if they can be free from sympathetic strikes and other useless interruptions to their work.

The increased cost to the workingman who buys or rents a home is the result of the mistaken policy which discourages efficiency in the building trade. A carpenter is fined $10 if another workman complains against him to the union for working too fast, a fine which has far-reaching results in checking the interest of the men in the progress of their work. A plumber has been fined $50 for the same offense. The contractor or employer is subjected to a heavy fine if he so far forgets himself for a few moments as to perform a little labor. On frivolous pretexts fines of this character have been imposed on contractors, who have had to suspend business until the fine was paid, as none of the unions will permit their men to work for a contractor who does not obey strictly their trade regulations.

The city, outside of the steel mills, is strictly a closed shop town. Two years ago some of the contractors made the experiment of employing crews of nonunion men, but mysterious educational committees appeared on the scene and dealt so harshly with the invaders that nonunion workmen now give Gary a wide berth.

#### Local Unions Pursue Arbitrary Methods.

Even a union card does not entitle a workman from any other city to engage in his occupation at Gary until he has obtained a license or membership from the local unions. Contractors are often embarrassed by long delays because they cannot get skilled men for special work, although they know of outside union men in good standing whom they could employ if the local unions would permit it. The carpenters are relaxing somewhat their monopolistic policy in this respect and now seldom refuse the applications of a union man for permission to work in Gary, and the bricklayers are furnishing good men whose work is very satisfactory. The plumbers' local, however, before admitting an outside union man exacts a fee which seems to be adjusted on the basis of making it cost a workman $100, giving him credit on this amount for what he paid to join the local in his home city.

The steel mills at Gary, conducted on the open shop plan, with no restrictions on the efficiency of machines or men, pay high wages and have reduced the labor cost per unit of product to the lowest figure that has been reached in any plant of the same character in the world. The United States Steel Corporation, however, is leaving the city to itself, having carefully avoided the patriarchal policy which led to criticism at Pullman. Lots are sold to workingmen as low as $300, a price which covers the original cost of the land, the street paving, sidewalks, sewers, gas and water mains. The deed contains a few restrictions regarding the use of the property, but the affairs of the city are left to the citizens and investors to work out its problems for themselves. The contractors have organized an association which has made some progress in securing protection against sympathetic strikes and other forms of union extortion, but they do not have educational committees and are thus at a disadvantage in dealing with the building trades unions, as they cannot present so solid a front when any difference arises. People must have homes and stores and must pay whatever price is necessary, but the situation throws a curious light on the cost of living to the workingman, and suggests that union restrictions may have a greater influence than has been generally suspected on high rents and the high cost of doing business in a large city.

**The Youngstown Sheet & Tube Company Inspection Trip.**—In the article printed in *The Iron Age* of March 24, giving an account of the visit of members of the National Association of Jobbers of Wrought Pipe and Fittings to the plant of the Youngstown Sheet & Tube Company, several errors occurred. The company has already two blast furnaces in operation and is building a third, while the size of the building containing the threading department is 80 x 600 ft., instead of 80 x 100 ft., as stated in the article.

# THE IRON AGE

**Established in 1855.**

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## Labor Combinations to Destroy Business.

In a Missouri Circuit Court, sitting at St. Joseph, a decision was given last week which brushes aside the "peaceable persuasion" and other pleasant aliases of picketing as commonly resorted to by labor unions and calls this form of intimidation the unlawful thing it is meant to be. In the strike of the Berry Foundry & Mfg. Company's molders against piece work the company was able to get men to take the places of the strikers, having about 3000 applications in response to advertisements. For 10 weeks the usual picketing tactics were resorted to, with the exception that no special show of violence was made in the daytime. At night, however, the methods of persuasion became thoroughly recognizable—assaults upon the new employees, or those verbal forms of intimidation which the members of the unions, with no thought apparently of qualifying as humorists, asked the court to regard as friendly solicitation. Then came the application for an injunction, and, in line with usual practice, an early day was fixed for the hearing. After a six days' trial the court made the temporary injunction permanent.

The court, after reviewing from 20 to 30 instances of violence, made it plain again that "mere picketing" is not the peaceable thing the unions would have us believe. The judge suggested that if the foundry company should use a similar method against the strikers to prevent their selling their services where they chose they would take a very different view of its legality. The upshot of the case was that the acts involved in picketing as carried on were declared unlawful, as being the result of a conspiracy to injure the company and its workmen, and the temporary injunction was made permanent.

A particularly interesting feature of this case is the company's claim against the members of the union for $10,000 damages for loss sustained because of the strikers' interference with the operation of its plant. This remains to be passed upon, but it is inferred from the comment of the court that damages in some amount will be recovered. Such an award would be a decided innovation in such cases. Yet it is not difficult to see an analogy to the damages levied upon the Hatters' Union in the recent Danbury boycott case, the evidence in both cases tending to show a conspiracy to damage or even destroy the business of the company.

The whole procedure of those unions which make war upon employers who refuse their demands is based on the assumption that men who give up employment in a body still sustain a special relation to their former employer and the plant they have left. An individual giving up one place of employment that he may accept another would be deemed deluded indeed if he attempted to prevent another worker from taking up the work he had left. But the strike, by what logic it is hard to divine, is held to confer unusual rights on strikers. They can both declare their places vacant and decree that no others may fill them. Any and all means employed to keep their places vacant even to the ruin of the employer's business are defended. A strike that does not injure the employer so seriously that he is glad to end it on the strikers' terms lacks the essence of a strike in the union view. As one labor paper put it, in commenting on the Danbury boycott decision: "The existing situation is equivalent to telling us that we have a right to strike in self-defense, but that if the blow hurts we will be punished." There is the union definition of a strike—a "blow" at the business with which the strikers have severed connection, and a blow that "hurts." We have not come to the point yet of lodging in the hands of labor unions the right to declare war on whom they will, and the specious talk about striking a blow in self-defense is quickly penetrated when it comes under the scrutiny of the courts.

The unions have striven hard to get Congress to enact a law providing in effect that in labor disputes nothing shall be unlawful when done by a number of men in combination unless the act is unlawful when done by an individual. In other words, the gathering of a mob must be lawful because there is nothing unlawful in an individual standing upon a street. Also a conspiracy to destroy a business by the use of the boycott and secondary boycott must be lawful because an individual has the right to withhold his patronage from any person or business. The massing of members has been the strength of the unions; by combination they have been of great service to the individual member. But they cannot escape responsibility for this power of numbers when exerted to destroy an individual manufacturer or an individual nonunion worker; indeed, the massing of numbers to crush out an individual is the very essence of the crime. Just at a time when the law's penalties are being enforced against great corporations for using their power to destroy a competing business, it need not be expected that the unincorporated union can make like use of its power against an uncompliant business and go quit of the law.

## Agreements Between Manufacturers and Dealers.

It is highly probable that the forthcoming machinery dealers' conventions will bring out some discussion over the question of manufacturers keeping their agreements with dealers. Machinery makers should appreciate the fact that when a dealer works up a sale he has undoubtedly spent considerable time and gone to some expense in doing so, but too frequently when the prospective purchaser has become interested in a manufacturer's product through a dealer's efforts the purchaser appeals to the maker for a price under the dealer's quotations and gets it. Some machinery manufacturers have been known to close out such business by accept-

ing from the consumer the same price they would charge the dealer, regardless of the fact that a selling agreement existed.

Machinery makers who adopt such tactics should consider that the dealer has saved them selling expenses in working up business for them, and consequently they should make a proper reduction to the dealer, so that the latter might be able to sell at the same price the manufacturers make to consumers in territories where they have no selling arrangement with dealers. It seems that the manufacturer who undersells the dealer with whom he has a business arrangement has been lax in his cost estimates. A cost system making a proper reduction to dealers based on the saving in selling cost, balanced by advanced quotations to consumers covering legitimate selling expenses, would be to the advantage of both the manufacturer and dealer, and incidentally the consumer would have no complaint to make.

Machinery manufacturers are expressing much gratification that their collections are showing considerable improvement as compared with earlier months in the year. They state, however, that buyers almost invariably insist upon basing terms f.o.b. destination, instead of at the point of shipment, or of practically putting that interpretation on them. The burden of delayed traffic therefore falls upon manufacturers, especially as dealers, in their capacity of middlemen, usually manage to sidestep it. This is a point which, with the apparently increasing incapacity of the railroads to handle the business of the country promptly, merits serious consideration by machinery builders and dealers. By some concerted action means may perhaps be found of inforcing a fair division of the burden, to the ultimate benefit of all concerned.

## The Transcontinental Railway List of Machine Tools.

Our Chicago machinery market report this week gives a long list of machine tools on which bids are asked by the commissioners of the Transcontinental Railway of Canada for the Winnipeg shops of that system. The list is one which will greatly interest manufacturers on this side of the border, and doubtless many of our manufacturers will endeavor to get at least a portion of the business. An unusual feature of the request for bids on this array of equipment is the stipulation that deposits of 10 per cent. must accompany such bids to insure consideration. This has called forth much criticism from our manufacturers, as it seems unnecessary.

In common construction work on Government contracts it is not unusual for bidders to be required to submit certified checks with their bids as evidence of their good faith and responsibility. This has a tendency to shut out irresponsible shoestring bidders whose operations would be embarrassing on public contracts. Machine tool manufacturers, however, are people of the highest responsibility. There is no speculation in their product, and irresponsible contractors have no opportunity to make speculative bids on the equipment of a railroad shop. Each manufacturer who bids is put to considerable expense in figuring his estimates, and where competition is so keen as on a large railroad list the total expenditure of all the bidders exceeds the profit of the one who is successful. When, in addition to this expenditure, the manufacturer is expected to deposit 10 per cent. of his bid for an indefinite time in the equivalent of cash it adds a serious burden to the expense of obtaining the business. Deposits from only 10 bidders would make an aggregate greater than the value of the machines to be purchased.

Machine tool manufacturers need their money to carry on their necessary business, and an arbitrary requirement for a cash deposit might have the effect of restricting competition to a narrow limit, and in the end the buyer would be forced to pay higher prices than if he followed the established custom of the trade. It is likely that the manufacturers of Europe and America will compete sharply on so large a Canadian list of machine tools. Hence it is interesting to note that in preparing the specifications the commissioners in many cases have specified the number and page of the catalogue of some leading American house to designate the type of machine that is sought.

## The Uniform Code of Demurrage Rules.

The shippers of the country will have an opportunity to make a thorough trial of the uniform code of demurrage rules which was compiled last fall by a committee of the National Association of Railway Commissioners, assisted by a committee of railroad experts. This code, as reported in *The Iron Age* at the time, was duly adopted by the association of commissioners and was subsequently indorsed or recommended by the Interstate Commerce Commission. One by one, the various district demurrage associations of the country have adopted the new rules, overriding all objections that have been offered by shippers and manufacturing interests, the new code being filed by the railroads as tariffs at Washington.

The average plan which is provided for in the new code is looked upon with favor by many shippers, and those who do not avail themselves of its advantages are given considerable protection against bunching of cars by delays in transit. The switching time which was formerly allowed to industrial railroads, or to industries which do their own switching, is cut off, and there are many other restrictions which time may prove to be hardships to the industrial or shipping interests affected. In Chicago the grain shippers obtained a temporary injunction in the Federal Court to delay the enforcement of the new code in so far as it related to grain, until the Interstate Commerce Commission could pass on the reasonableness of the rules on a complaint to be filed. The court later dissolved this injunction, however. Traffic conditions during the past winter have been abnormal, and where the new rules have been in effect comparisons with former periods would be of little value. When conditions become normal again there will be a fair opportunity for comparisons, and the shipping interests will then be able to determine what course they should take. It will be found difficult, however, to obtain any change in conditions in the future, owing to the fact that the national code has behind it the combined authority of the American Railway Association, the Interstate Commerce Commission and the State commissions which participated in the work of initiating the code. The dividing line of authority between the national and State commissions on questions of demurrage has not yet been clearly drawn by the courts, and considerable time may elapse before

the United States Supreme Court shall have an opportunity to pass upon all phases of the questions involved. Meantime, the rules are filed by the railroads with the Interstate Commerce Commission as tariffs, and long delays and expensive litigation must intervene if any change is sought by shippers which the railroads are not willing to concede voluntarily through their demurrage bureaus.

## Our Tariff Relations Satisfactorily Adjusted.

Assuming that the reported amicable understanding with Canada is correct, the business interests of the country are to be congratulated on the disappearance of possible tariff controversies. March 31 was the date fixed by the Payne Tariff act for the automatic operation of the maximum tariff on products imported from countries which had not made satisfactory arrangements for allowing their minimum rates of duty on products imported from the United States. Until quite recently, serious danger existed that we might become involved in tariff disagreements with France and Canada, which in either case would have injured important American branches of trade. The work involved in the arrangement of these commercial agreements has been tremendous, as more than 100 proclamations have been signed by President Taft granting the minimum rates to as many separate countries.

## New York City's New Subways.

Out of the 29 different rapid transit routes laid out and formally adopted by New York City authorities, involving an outlay of $200,000,000, the *Wall Street Journal* gives some details of the four which the Public Service Commission has selected as promising the quickest relief to the present congested conditions. These will cost $113,000,000, will have a total of 42.77 miles, cost and mileage being distributed as follows:

| | Miles. | Cost. |
|---|---|---|
| Broadway-Lexington line | 22.64 | $75,000,000 |
| Fort Hamilton extensions | 9.17 | 18,000,000 |
| Broadway-Lafayette line | 4.96 | 13,000,000 |
| Canal street line | 1.00 | 7,000,000 |
| Totals | 42.77 | $113,000,000 |

The four favored routes, constituting the tri-borough system as above, are as follows:

Broadway-Lexington avenue line beginning at the Battery and running under Church street to Vesey, to Broadway, thence to Ninth street, under private property and the Interborough subway to Lexington avenue at Fourteenth street; under Lexington avenue to the Harlem River and 138th street. From that point two branch lines will extend, one running eastward under 138th street to Southern boulevard and via Westchester avenue to Pelham Bay Park. The other Bronx branch will pass under Mott, Gerard and River avenues to Jerome avenue, becoming an elevated line at the junction of River and Jerome avenues, extending as an elevated system to Woodlawn Cemetery.

Canal street line extends from the North River to the Manhattan end of the Manhattan Bridge, near Centre street.

Broadway-Lafayette (Brooklyn) line runs from the Brooklyn end of the Williamsburg Bridge under Broadway, Brooklyn, to its intersection with Lafayette avenue, there turning and following a return course under Lafayette avenue to Flatbush avenue, connecting with the Brooklyn Fourth avenue subway, now under construction.

Fort Hamilton extensions, which are branches of the Brooklyn Fourth avenue subway, start at the connection of the Fourth avenue subway at Fortieth street and run to New Utrecht avenue, to Eighty-sixth street and thence as an elevated line to Coney Island on one branch and continue as a subway route to Fort Hamilton on the other.

## An Anti-Picketing Injunction, with a Claim for Damages.

In the Circuit Court at St. Joseph, Mo., March 24, a decision was given making permanent a temporary injunction secured March 12 by the Berry Foundry & Mfg. Company of St. Joseph against members of the Iron Molders' Union, who had gone out on a strike and had been interfering with the men employed to take their places. An unusual feature of these injunction proceedings was a claim of $10,000 damages put in by the company, which alleged that the interference of the strikers had reduced the output and earnings of the foundry and had necessitated an unusual expense in operation. The court in making the decision said that at a later date it would pass upon the amount of damages. Reference was made to several items in the bill of damages which the court said would not be allowed, but the inference from what was said was that damages would be awarded.

The company's dispute with the Iron Molders' Union was the result of notice that the piece price system would be put in effect in the foundry January 3. The men had been getting $3 a day of nine hours and about 60 molders and coremakers were employed. Some of them, the company considered, were entitled to receive higher wages, while others were not. About 90 per cent. of the output is railroad castings. The company was willing to put in the piece price system temporarily, agreeing to change it if at the end of a few months it was found not to be working advantageously. Some of the men were willing to try it, while others objected. The strike came January 3. Through advertising in various cities the company received nearly 3000 applications. The union immediately picketed the plant and stopped every stranger from approaching it. The strikers used no violence around the premises in the daytime, but by collecting on the street corners exerted an influence which the company claimed was intimidation of men willing to work in the plant. At night when any of the new men were caught on the streets they were beaten or were menaced. It became necessary to board the new workers at the plant.

When the temporary restraining order was granted, March 12, the final hearing was set for March 18. It lasted until March 24. In part the comment of the court was as follows:

> The Berry Foundry Company, by one means and another, brought in men to take the strikers' places. It developed that in almost every instance these men were inflammatory. Whether right was always on their side or not, they were at least resentful of any overtures made to them by the strikers. I can't say much for the characters of these so-called strikebreakers, but that is neither here nor there. Mr. Berry had the right to go where he would for his help. We have here 20 or 30 instances of violence, the initial cause of which was the union men going to the strikebreakers and soliciting them. It is a surprising thing to me that these solicitations should be persisted in, in view of the fact that every such approach was met with rebuff and a storm of vituperation and filth. . . .
>
> It may be argued that the mere picketing of a place does not amount to a violation of the plaintiff's rights, but I am free to say that if the Berry Foundry Company used the same means in respect to the strikers, to interfere with their selling their services where they would, the situation would look entirely different. These strikers are seeking to take away from the company the free right to employ men to take their places, and the picketing is a means to that end. In their persistence in these tactics the strikers have gone beyond the rights accorded them by law; their acts amount to a violation of the law, and to such a violation as the law will restrain permanently. The injunction is made permanent.

## Against Sunday Labor.

### Action by Officers of the Steel Corporation.

#### They Insist on a 24-Hour Interval Each Week in the Production of Ingots.

An important step has been taken by the United States Steel Corporation in the direction of the abolition of Sunday labor to the largest possible extent at the plants of the various subsidiary companies. This matter has been agitated in the councils of the Steel Corporation for more than three years. It has been admitted by those who have stood for the right of every man in the employ of the companies it represents to have one day out of seven for rest and recreation, that conditions in the steel industry could not at once be adjusted so as to make this possible. The continuity of blast furnace operations has been accepted as a necessary condition the country over. Certain practices in steel works, also, have encroached to an extent upon Sunday hours, and at some plants the tendency has been in the past few years to an increase in the amount of repair work, rolling mill operations and even loading and unloading performed on Sunday. That the Steel Corporation heads have determined to take a firm stand in opposition to Sunday labor is indicated by the following telegram recently sent by Chairman Gary to the presidents of all the subsidiary companies:

"NEW YORK, March 21, 1910.

"Mr. Corey, Mr. Dickson and I have lately given much serious thought to the subject matter of resolution passed by Finance Committee April 23, 1907, concerning Sunday or seventh day labor. Mr. Corey has written you on the subject within a day or two. The object of this telegram is to say that all of us expect and insist that hereafter the spirit of the resolution will be observed and carried into effect. There should and must be no unnecessary deviation without first taking up the question with our Finance Committee and asking for a change of the views of the committee, which probably will not under any circumstances be secured. I emphasize the fact that there should be at least 24 continuous hours' interval during each week in the production of ingots.

"(Signed) E. H. GARY."

The previous action to which Judge Gary's telegram refers was taken by the Finance Committee at its meeting of April 23, 1907, and is recorded in the minutes of the committee as follows:

"On motion, it was voted to recommend to all subsidiary companies that Sunday labor be reduced to the minimum; that all work (excepting such repair work as cannot be done while operating) be suspended on Sunday at all steel works, rolling mills, shops, quarries and docks; that there shall be no construction work, loading or unloading of materials. It is understood that it is not at present practicable to apply the recommendation to all departments, notably the blast furnaces, but it is desirable that the spirit of the recommendation be observed to the fullest extent within reason."

The pressure of business in the greater part of 1907, as is well known, was not favorable to the largest observance of the spirit of the above resolution. As time passed, even though there was no such demand for mill products in 1908 and a portion of 1909 as in the two preceding years, the competition for tonnage records appears to have led to a continuance of certain Sunday schedules followed in those crowded years. To the publicity given through the Pittsburgh *Survey* to the amount of Sunday work done in the steel industry in and about that city was no doubt due in part the fresh agitation of the matter within the Steel Corporation.

Concerning the Sunday work heretofore done in the Pittsburgh district, Paul U. Kellogg, editor of the *Survey*, the magazine published by the Charity Organization Society of the City of New York, comments as follows:

In collaboration with Prof. John R. Commons, John A. Fitch of the University of Wisconsin estimated that one steel worker out of five in Allegheny County worked on seven days in the week—1650 men in the open hearths, 8000 in the blast furnaces and 3500 in the rolling mills and yards, a total of 13,000 in the mills and furnaces of the one county. This Sunday work has been of three kinds: First, at blast furnaces. These are operated continuously night and day, 365 days a year, and there is said to be large financial loss in closing them down. Second, in rolling out steel. The rolls used to be put in operation at 6 a.m. Monday; then they were set going at 12 midnight Sunday, and following that were started up at 6 p.m. Sunday afternoon. Every time the hour for beginning work on the rolls was brought forward it called out the workers in open hearths and heating furnaces earlier in order to get the ingots ready for them. The open hearth furnaces have usually been operated from Sunday morning straight through to the Saturday night following, although the full crews have not had to report until noon or later on Sunday. The third class of Sunday work has been of the sort which took advantage of the Sunday lull in routine operations, repair work, new construction, cleaning up, loading and unloading, for all of which many laborers, cranemen, engineers, firemen, millwrights and machinists, beside the regular mill watchmen, have been on duty seven days in the week. The action taken the past fortnight by the Steel Corporation eliminates much of this extra Sunday work and strikes at the encroachments upon the Sunday interval in the open hearth and rolling mill departments. The continuous processes, best exemplified by the blast furnaces, are not touched by the resolution of three years ago or the present telegram.

The *Survey* in its issue this week will say:

The executive heads of the steel industry are to be congratulated on calling for an implicit observance of the resolution of 1907. It is a piece of business courage and determination, in line with the best impulses and soundest judgment of some of the broadest minded men in the industry. That single telegram means a more normal working week for thousands of workers. Officials of the corporation are authority for the statement that equally serious consideration is being given to the question of the compulsory six-day week in the continuous processes. In a half dozen foreign countries a six-day week for the working force is made compulsory by law in such operations. There are sound economic grounds for such a change. A six-day man can do better and a bigger work than one who goes into harness seven days a week the year round. If an equally progressive stand is taken on this point, the Steel Corporation will have done a full piece of work in eradicating a system which, half reformed, must continue to cramp life and dull efficiency. Such action will have great influence not only in the industry as a whole, but in other employments in which operation must be continuous and in which the pressure for output is equally insistent.

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The Chandler-Boyd Supply Company announces the commencement of its general mill supply business on April 15, at the Terminal Warehouses, Pittsburgh, Pa., with a complete stock of iron and brass pipe fittings and valves, wrought iron pipe and steam specialties. As special jobber of the Pittsburgh Valve & Fittings Company's goods in the Pittsburgh district, it will carry in stock a large and varied assortment of "P" fittings for immediate shipment. Pipe fittings and valves of a special nature can be made to order and furnished on short notice, as the factory at Barberton, Ohio, one of the largest and most modern plants of the kind in the United States, can deliver to the company's warehouse by freight in one day or by express in a few hours.

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The American Locomotive Company is making some improvements at its Richmond, Va., plant. No extensive equipment will be required for the addition.

## Walter M. McFarland.

Walter M. McFarland, who has been associated with the Westinghouse Electric & Mfg. Company since January 1, 1899, has resigned to accept an official position with the Babcock & Wilcox Company. He occupied the office of acting vice-president for the Westinghouse Electric & Mfg. Company for a period extending over 10 years. In this capacity he had official supervision of the large contracts of the company, as well as being the advisory head in all the co-operative movements of the company with the associated Westinghouse companies involving literature, advertising and exhibition work. He did much to systematize and improve the work of the departments with which he came in contact, and through his personal qualities won the confidence and respect of the large number of employees looking to him for guidance and direction.

Mr. McFarland was born in Washington, D. C., in 1859. His education was received in the public schools of Washington, the preparatory department of Columbia University and the United States Naval Academy. He entered the latter institution as a cadet engineer in

WALTER M. McFARLAND.

1875, and in 1879 was graduated second in his class. In 1881 he was commissioned as assistant engineer, in 1891 as past assistant engineer, and in 1898 as chief engineer. He was the youngest officer for more than 20 years to have reached the latter grade. When the Personnel Board was assembled by the Secretary of the Navy in 1897, Mr. McFarland had the honor of acting as the sole sponsor for the younger men of his corps. In 1899, after the passage of the Personnel bill, he was commissioned lieutenant, and the same year resigned to enter the employ of the Westinghouse Electric & Mfg. Company.

After having had wide experience in sea service, he was detailed to the Bureau of Steam Engineering in 1882. From 1883 to 1885 he was detailed from the navy as assistant professor of mechanical engineering at Cornell University, and during the years 1885 and 1886 he was occupied with the inspection of machinery then building and with work on preliminary design for proposed vessels. From 1889 to 1894 he was again attached to the Bureau of Steam Engineering.

Mr. McFarland was vice-president of the American Society of Mechanical Engineers in the year 1907, and at the present time is vice-president of the Society of Naval Architects and Marine Engineers. He is also a member of the Engineers' Club of New York, Duquesne Club of Pittsburgh, the Army and Navy Club of Washington and the Army and Navy Club of New York. He has been a frequent contributor to the technical press, and his papers on engineering topics have won for him an enviable reputation as an engineer of broad experience and advanced ideas. He will be located at the general offices of the Babcock & Wilcox Company in the Singer Building, New York City.

## The Rogers-Brown Iron Company's Properties.

Offerings have been made recently of the unsold portion of $4,500,000 of first and refunding mortgage bonds of the Rogers-Brown Iron Company, which, as has been outlined in a previous article in these columns, will acquire the Buffalo & Susquehanna Iron Company, Buffalo, and will build two additional blast furnaces. A statement by President Wm. A. Rogers gives some facts about the properties involved and the results of the operation of the two existing blast furnaces.

The ore lands that company controls in Minnesota and Michigan contain upward of 30,000,000 tons of iron ore. The company also controls for 40 years the output of 3800 acres of coal land at Tyler and Sykesville, Pa., estimated to contain 22,000,000 tons of good coking coal, and fully equipped with mining machinery, coking ovens, &c. The value of the Buffalo & Susquehanna Iron Company property and leasehold interests, together with cost of the new plant, is estimated at $15,200,000, while the accumulated surplus, as of January 1, 1910, amounted to an additional $1,286,638, represented by cash and other current assets. Approximately 250,000 tons of ore per annum is now being mined from the Minnesota property. The enlarged plant will probably require 1,050,000 tons annually. The output of the Minnesota and Michigan properties can be increased as required to 2,500,000 tons per annum. The existing furnaces from July, 1905, to December 31, 1909, have earned net at the rate of $623,220 per annum. Upon completion of the new furnaces net earnings are estimated at $1,500,000 per annum. It is estimated that the net earnnigs during the current fiscal year ending April 30, 1910, based on actual results for eight months, will equal $918,000. An important economy (estimated at $8,000,000, on the basis of 20,000,000 tons of ore) will be effected by removing the surface from the Hibbing ore property, after which the ore can be mined directly into freight cars with steam shovels and by the milling process. The ore supplies are estimated to be ample for 30 years' operation and a large supply of fuel is assured for 40 years at favorable rates.

**The Jones & Laughlin Aliquippa Furnaces.**—No. 3 blast furnace of the Jones & Laughlin Steel Company at Aliquippa, Pa., is nearly finished, and will be ready to put in blast about April 10. This will make three stacks in operation at Aliquippa, all built by the Riter-Conley Mfg. Company, Pittsburgh. The Jones & Laughlin Steel Company is itself building a fourth blast furnace at Aliquippa, of the same design as the three stacks built by the Riter-Conley Company, but it will not be ready for blast until some time in the fall. The furnaces will all be of the same sizes, 20 x 85 ft., of the Julian Kennedy type, and equipped with Kennedy-Cowper hot blast stoves. The four stacks will make from 1800 to 2000 tons of Bessemer pig iron per day.

Walter O. Amsler, Wabash Building, Pittsburgh, has received a contract for the erection of an Amsler hot blast stove, 18 x 70 ft., for the Lawrence Iron Company, Ironton, Ohio, and a contract for the erection of two Amsler gas producers, including scrubbers and purifiers, to take care of a 500-hp. gas engine installation for the Reading Iron Company, Reading, Pa.

### The Mesta Machine Company.

The Mesta Machine Company has moved its city office from the Lewis Building to suite 1244-1246 Oliver Building, Pittsburgh. Recent shipments made from West Homestead, Pa., where its plant and general offices are located, include the following: Dunbar Furnace Company, Dunbar, Pa., one 44 and 84 x 84 in. high pressure blowing engine; Salem Iron Company, Leetonia, Ohio, one 84 and 84 x 84 in. low pressure blowing engine; Wickwire Steel Company, Buffalo, N. Y., one 44 and 84 x 84 in. high pressure blowing engine; Bethlehem Steel Company, South Bethlehem, Pa., two 46-in. cast steel machine molded staggered tooth roll pinions for its 46-in. gray mill; Tennessee Coal, Iron & Railroad Company, Ensley, Ala., two 43-in. and two 36-in. nickel steel machine molded roll pinions for its blowing mill; Worth Brothers Company, Coatesville, Pa., one cast steel 39 5-16 in. top or bottom and one nickel steel 22 15-16 in. middle machine, quintuple staggered plate mill pinions, the results obtained from the original set shipped six months ago having been so satisfactory as to induce this second contract. John Mohr & Sons, Chicago, who have the contract with the Indiana Steel Company, Gary, Ind., covering two 400-ton metal mixers, are having the Mesta Machine Company turn out the two sets of tilting machinery, one of which has been shipped and the other is to follow shortly. The Atlanta Steel Company, Atlanta, Ga., is having two 44-in. Helander barometric condensers and an 11 and 24 x 21 in. dry air pump shipped. A shipment of 30 26-in. chilled rolls for hot sheet mills was recently made to the Vandergrift Works of the American Sheet & Tin Plate Company and 16 26-in. rolls to its New Castle plant, while other late shipments consisted of chilled, sand and steel rolls, pinions, gross and miscellaneous other mill machinery for various iron and steel works.

The Mesta Machine Company has recently added some new equipment that includes a motor driven Gleason gear planer, which has a capacity of spur gears 20 ft. in diameter and bevel gears 16 ft. in diameter; one smaller Gleason gear planer, with a capacity for 6-ft. gears; one large Betts boring mill, and one medium sized Niles-Bement-Pond boring mill, while a large Mesta pit lathe recently installed takes in flywheels up to 34 ft. in diameter. A Mesta compound Corliss air compressor of 1500 ft. of free air per minute at 100 lb. pressure to the square inch, operating at 90 rev. per min., has been installed in the power plant. A new Mesta 600-hp. gas engine of the horizontal tandem type will shortly be added.

### Analysis Books for Lake Ores in 1910.

In its analysis book of the Lake Superior ores it will ship in 1910 the firm of M. A. Hanna & Co., Perry-Payne Building, Cleveland, shows 9 Bessemer ores, 23 non-Bessemer, 1 manganiferous and 2 silicious, a total of 35, of which 16 come from the Mesaba range, while 19 are distributed among the Marquette, Menominee and Gogebic ranges. A feature of the book is a number of tables giving the unit value, or rather the increase or decrease in unit value, between successive percentages of iron, for the four classes of ore. The base unit is obtained in each case by regarding the ore as delivered in the Mahoning alley, that being taken as the average point of delivery. For example, while the price of the old range Bessemer base ore is $5 at Lake Erie port, the price delivered in the Mahoning Valley is $5.60. This price divided by 55, the percentage of iron, natural, in the base ore, gives 10.182 cents as the base unit.

Oglebay, Norton & Co., Wade Building, Cleveland, have sent to the consumers of Lake Superior ores their analyses of ores they will ship in 1910. Twenty-three ores are listed, all coming from the Gogebic and Menominee ranges except the Moose Mountain, Canada, and the Bray, a new coarse red hematite from the Mesaba range. The Bray runs 58.53 per cent iron, 0.065 phosphorus, 7.10 silica, 1.22 manganese and 2.35 alumina, and has 13.34 per cent. combined moisture.

### Phelps, Dodge & Co.'s Annual Report.

The annual report of Phelps, Dodge & Co., Inc., New York, for the year ending December 31, 1909, shows the following financial results: Dividends received from subsidiary companies, $5,769,354.50; commissions and miscellaneous earnings, $256,385.67; total income, $6,025,740.17. Dividends paid, $5,396,652; expenses, taxes, &c., $182,528.68. The amount transferred to surplus account was $446,559.49. The report gives details of the operations of the subsidiary companies, comprising the Copper Queen Consolidated Mining Company, Detroit Copper Mining Company of Arizona, Montezuma Copper Company, and Stag Cañon Fuel Company.

The copper sales department in 1909 marketed 185,033,415 lb. of copper on account of the subsidiary companies and other producers.

The report states that an employees' benefit association has been inaugurated by the Copper Queen Consolidated Mining Company, using the form adopted by the International Harvester Company, and basing it on contributions by the employee of 2 per cent. of his monthly wages. To the fund thus created, and which is administered by a board composed of officers and employees, the company subscribes $15,000 annually if 50 per cent. of the employees join, and $25,000 annually if 75 per cent. join. The policyholder receives half wages if sick or injured, while one year's wages is paid to his heirs should he die from sickness and two years' wages should he meet death by accident. Other payments are made for losses of limbs, &c. On January 1, 1910, the date on which the association commenced business, over 75 per cent. of the employees were policyholders and almost 94 per cent. of the miners had joined.

### The Increasing Use of Copper Clad Steel Wire.

Although the copper clad wire manufactured by the Duplex Metals Company, 149 Broadway, New York City, has been on the market for a comparatively short time, letters which the company has received from some of its customers indicate that it is already extensively used and giving splendid service. The superintendent of the telegraph department of a large Western railroad reports that five divisions of his line are equipped with No. 9 B. & S. gauge wire and that the results have been so satisfactory that he will shortly request about 7000 miles additional wire of the same grade. During two severe sleet storms last winter it was the only wire that had a record of no failures. The signal engineer of another road stated that copper clad wire stood the storms last winter without a break, while new No. 8 galvanized iron wire on the same poles broke in several places. In a Pennsylvania municipality the city electrician intends to use this wire for running new circuits and all repair work during the present year, and will eventually replace all the overhead wiring with it. The advantage of this wire over ordinary copper is greater tensile strength, and it is superior to iron and steel wire because of freedom from corrosion. These two advantages result from the method of construction, which is the welding of a copper covering around a steel wire billet.

The firm of D. Lamond & Son, engineers and contractors, has been dissolved, and the business will be carried on by David D. Lamond under the name of D. D. Lamond & Co., with offices in rooms 702-703 Ferguson Building, Pittsburgh.

## The Keystone Tube Company Will Build at Connellsville, Pa.

Owing to the failure of negotiations between the Queen Junction Land Company and the Keystone Tube Company, recently organized at Pittsburgh, by which the plant of the latter company was to be located at Queen Junction, Pa., it has decided to accept the offer from the Chamber of Commerce at Connellsville, Pa., and will build its plant at that place. A site has been secured of about 15 acres located at Wheeler Station, across the river from Connellsville, Pa. The Pennsylvania and Baltimore & Ohio railroads pass on two sides of the property, and the proposed extensions of the Pittsburgh & Lake Erie and Western Maryland will be nearby. Ample supplies of gas, coal and coke are close at hand.

Work on the new plant has already been started and will be pushed as fast as possible. The main building will be of brick and steel, 69 x 250 ft., and will be equipped with two gas bell welding furnaces, tube mill machinery and a cold turning department. A lean-to, 20 x 60 ft., will house a 200-hp. steam turbine, while other buildings will be used for stockrooms and offices. The company will make tubes from ⅝ in. up to 3 in. outside diameter, for use in the manufacture of metal beds, trolley poles, &c., as well as for conduits. The company states that its output will be about 10,000 tons yearly.

The Keystone Tube Company has a Delaware charter, with a capital stock of $200,000. I. W. Bollinger is president; F. C. Ferrott, vice-president; James E. McNary, treasurer, and Joshua Nuttall, secretary. All are experienced in the manufacture of tubes and have a wide acquaintance in the trade. Offices will be maintained in Pittsburgh and the company will be in the market as a seller of tubes in the latter part of June.

## The Hagstrom Brothers Manufacturing Company.

The Topeka *Daily Capital* of March 13 gives a most interesting sketch of the rise of an important manufacturing business in the town of Lindsborg, in the center of Kansas. Three boys, named Hagstrom, reared on a farm, developed mechanical talent and for several years, until 1907, they conducted a machine shop. Their attention was then turned to specialties of their own invention. Beginning with a soot proof spark plug for automobiles, they built up such a large business that they organized the Hagstrom Brothers Mfg. Company for the manufacture and sale of automobile and electric accessories. They have twice enlarged their factory, which is now 30 x 200 ft., exclusive of the blacksmith shop, and an addition is under way which will double their present large output. They are the inventors and makers of a soot proof spark plug, blow out patch for tires, spark plug hand vise, porcelain tube cutter and several other devices of merit. It is a remarkable fact that these Kansas products are sold throughout the entire country. The brothers have perfected arrangements for the manufacture of an air craft, to be known as Hagstrom's Eagle monoplane. William Hagstrom is president of the company, Gustaf Hagstrom is treasurer, Emanuel Hagstrom is secretary and Edward Ahlstrom is superintendent.

The International Steam Pump Company, 115 Broadway, New York, is highly gratified by the fact that in a recent drilling contest between that company's Waugh and another popular buzzer drill, involving a purse of $400, the Waugh drill was successful. The speed attained by each was remarkable, as a few years ago it would have been considered an impossibility. The drilling was done in black syenite, and in a little less than an hour and a half the Waugh drilled 49 ft. 10½ in., and its competitor 39 ft. 9½ in. The Waugh drill weighed 62 lb. and its competitor 78 lb. It is claimed that no invention of recent years has done so much to reduce the cost of mine operation as buzzer drills.

## The Determination of Carbon by Combustion.

BY THOMAS C. WATTERS.*

In making determinations of carbon by combustion it is necessary to run the apparatus a considerable length of time to be sure that complete combustion has taken place. The result is that in nearly all cases the furnace is run at least twice as long as necessary. We have a very simple method in our laboratory for determining whether the operation is complete. Simple and effective as this is, we do not remember ever having heard of its being used elsewhere, and are inclined to think the application of the idea is original in our laboratory. Our train is made up in the usual manner, but we give a description of it herewith.

The combustion apparatus that we use consists of the usual U tube containers, regulation combustion furnace and oxygen tank. The oxygen is purified by passing it through a platinum preheater and U tubes containing a strong solution of potassium hydrate, stick potash and calcium chloride in the order named. The metal is decarbonized in the furnace and the products of combustion passed on through two tubes partially filled with sulphuric acid and then through calcium chloride into two absorption tubes containing soda lime and out through calcium chloride and sulphuric acid. Between the first chloride tube and the absorption tube there is a three-way stop cock, by means of which the gas may be conducted from the apparatus and passed into an alkaline solution of sodium hydrate, contained in a small test tube, to which phenolphthalein has been added as an indicator. Any carbon dioxide gas passing into this extremely weak solution will neutralize the alkali and discharge the red color produced by the indicator, showing, of course, that carbon dioxide is still passing through the apparatus and that combustion is incomplete.

An alkaline solution made with 0.003 gram of sodium hydrate to the litre is quite satisfactory; 1 c. c. of this solution held in a small test tube is used in making a test, and the gas from the apparatus is turned into it, allowing three or four bubbles to pass into the solution. The test tube is then shaken, and if the color remains the operator may be sure of the completion of his work.

By means of the following equation—2 NaHO: $CO_2$, :: 0.000003 gram: $x$ gram—I find that it requires 0.0000016 gram of carbon dioxide to neutralize 1 c. c. of the alkaline solution, and that as 0.0000016 gram of carbon dioxide contains 0.0000004 gram of carbon, the loss of carbon in making a test or two is so small that it may be disregarded. A U tube containing this solution can also be used at the end of the train to indicate whether any of the $CO_2$ has got past the absorption tube. I trust that this test may prove of as much value to others in the economy of time and in the feeling of security that comes with the certainty of completed work, as it has to me.

Telegraphic advices received from Indianapolis after page 731 of this issue had been printed state that the Security Trust Company has withdrawn as receiver of the Winona Technical Institute. Ex-Mayor Charles A. Bookwalter has been appointed receiver. He is a supporter of the institute and his policy will be constructive.

* Chemist Columbia Tool Steel Company, Chicago Heights, Ill.

## OBITUARY.

ALEXANDER AGASSIZ, the naturalist and president of the Calumet & Hecla Mining Company, died March 28 on the steamer Adriatic, bound from Southampton for New York. He was also a director of the Allouez, Centennial, Manitou and Smuggler Union mining companies, Frontenac Copper Company, New England Exploration Company, Marysville Dredging Company and Tecumseh Copper Company. His father was the noted naturalist Prof. Jean Paul Louis Rodolphe Agassiz, and he was born in Neuchatel, Switzerland, in 1835. His father came to America in 1846, but the son stayed in Switzerland until the death of his mother, when he came here at the age of 15, graduating from Harvard in the class of 1855, and then graduating in civil engineering from the Lawrence Scientific School of Harvard in 1857. In 1866 Professor Agassiz went to Lake Superior and was appointed treasurer of the Calumet mine, and in the following year he was appointed superintendent of the Hecla and Calumet mines. He returned to Boston in 1869 as president of the joint companies.

JOHN HEATHCOTE, Providence, R. I., died March 14, aged 77 years. He was born in England, but was taken to Providence when a boy. He learned the trade of machinist at the Franklin Foundry & Machine Company's works. After working several years for the Corliss & Nightingale Engine Company, he was employed for two or three years by Brown & Sharpe, next held an official position in one of the departments of the Franklin Foundry & Machine Company, and about 1866 started in business on his own account. In partnership with James Barbour under the firm name of Barbour & Heathcote, he established a business in steam, gas and water piping and brass finishings. A few years later he bought out the patent of the J. S. Winsor tentering and drying machine, and went into manufacturing. In 1874 he took over his partner's interest and continued the business alone. For many years he was treasurer of the Russell Electric Mfg. Company, maker of mast arms for electric lights. In later years he practically withdrew from active management in favor of his son.

SIMON DAVID JOSEPH, president of the Simon Joseph Iron Company, St. Louis, died suddenly March 25, aged 59 years. He had been president of the company for the past 18 years and had been connected with the iron trade since 1870. He was formerly in business at Cincinnati. He was a brother of Samuel Joseph, president of the Continental Iron & Steel Company, who died in France recently. The news of his brother's sudden decease is believed to have hastened his death, which was from an attack of acute indigestion.

GEORGE THOMPSON SWANK, the only brother of James M. Swank, general manager of the American Iron and Steel Association, Philadelphia, died at his home in Johnstown, Pa., March 20, aged 73 years. He was for many years the publisher and proprietor of the Johnstown *Tribune*. He had filled many local positions of honor and responsibility.

RALPH W. HICKOX, a Cleveland capitalist, died in Lyons, France, March 26, aged 60 years. He was a director of the Brown Hoisting Machinery Company and a trustee of the Stewart Iron Company, Ltd. Years ago he was actively interested in the iron and steel industry as treasurer of the Britton Iron & Steel Company.

CHARLES LOEB, president of the Zucker & Levett & Loeb Company, New York City, died March 20.

ALFRED BOX of Alfred Box & Co., Philadelphia, died suddenly March 20 from heart failure, aged 58 years. He had been engaged in the manufacture of hoists and cranes for the past 35 years.

MILTON DAVIS, a pioneer in the building of steam engines in Ohio and one of the organizers of the Buckeye Engine Company, Salem, Ohio, having been for many years vice-president of that company, died March 15, aged 87 years.

## PERSONAL.

N. L. McArthur, manager of the Seneca Chain Company, Mansfield, Ohio, has resigned, and is now manager of the Braddock plant of the Standard Chain Company at Braddock, Pa.

A testimonial dinner to Dr. Rossiter W. Raymond, in honor of his seventieth birthday, will be given at the Plaza Hotel, New York, on the evening of April 30. It is intended that the participation in this dinner shall not be confined solely to the members of engineering societies to which Dr. Raymond belongs, but shall include his personal friends as well. The arrangements are in charge of a committee, of which E. Gybbon Spilsbury is chairman; D. M. Riordan, treasurer; Joseph Struthers, 29 West Thirty-ninth street, New York, secretary.

Walter R. Okeson, for the past 10 years assistant engineer of the Phœnix Bridge Company, at Phœnixville, Pa., will after April 1 be located in New York as resident engineer of the Phœnix Bridge Company and the Phœnix Iron Company, succeeding Seymour P. Thomas, resigned.

John R. Allen, professor of mechanical engineering at the University of Michigan, will head the engineering school to be established at Robert College, Constantinople. The money for the new school will be taken from the bequest of the late John Stewart Kennedy. Professor Allen will go to Turkey early next summer.

Percy Longmuir, consulting metallurgist, has joined the permanent staff of Samuel Fox & Co., Ltd., Stockbridge Works, Sheffield, England, in the capacity of chief metallurgist and superintendent of research laboratories. The intention is to take full advantage of the aids offered by the higher branches of applied science, and to this end extensive chemical, physical and metallographical laboratories are being installed.

Charles H. Moyer of the George V. Cresson Company, 90 West street, New York, sailed March 26 for Europe on a business trip.

H. H. Peck, formerly New York sales agent for the Chester Steel Castings Company, Chester, Pa., has taken charge of the company's Chicago office.

J. D. Huddell has been appointed Eastern sales agent of the Pittsburgh Coal Company and Colonial Coke Company, with office at 2 Rector street, New York, succeeding Louis H. Washburn, deceased.

F. X. Cleary has been appointed advertising manager of the Western Electric Company. He has been with the company for about 20 years, and has held important positions connected with the execution of sales campaigns.

H. Sanborn Smith has resigned as general sales agent of the Lackawanna Steel Company, New York, to give his entire attention to personal interests. He is succeeded by Charles R. Robinson, who has been the Chicago sales agent of the company in the past two years, previously having been connected with the Inland Steel Company, Chicago.

A. R. Hunt, general manager of the Homestead Steel Works of the Carnegie Steel Company, Homestead, Pa., has appointed C. A. Hopkins metallurgist of the plant and C. P. McNiff assistant.

A. A. Keally, for some years sales manager of the Columbia Steel & Shafting Company, Pittsburgh, has resigned to become assistant to President Severn P. Ker of the Sharon Steel Hoop Company, Sharon, Pa. Mr. Keally has already assumed his new duties.

A. S. List, Wheeling, W. Va., has been elected a director of the La Belle Iron Works, Steubenville, Ohio, to succeed N. E. Whitaker, deceased.

# THE IRON AND METAL MARKETS

## Large Sales of Rails for Export.

### Indications of Record Shipments of Finished Products in March.

As for the past two months the most favorable account of iron trade conditions is that given by rolled products. The volume of new business seems well maintained, and if steel works and rolling mill capacity were not more than that of 1907, we should doubtless be entering upon a period of rising prices. That prices remain substantially unchanged with production at such an unparalleled rate, and with open markets in all departments of the trade, is good evidence of sustained buying.

Pig iron is still out of line. Prices are lower in all markets; notably so in the Central West since activity is greatest there. Michigan stove interests, as on several occasions, have pooled their buying, securing special concessions on large lots of Southern iron. It is now possible to buy No. 2 foundry iron at $12.50, Birmingham, for delivery into the third quarter. At Cincinnati inquiries for 15,000 to 20,000 tons of malleable pig iron are pending. In the Chicago district Southern sellers have made low offers, and considerable business was done, including 7500 tons for a large radiator company.

Pipe foundries are still in the market, while the total of their purchases from weak sellers in the past month is not small. On gray forge iron reports indicate concessions representing more than the usual difference between forge and No. 2 foundry.

In the Central West it is considered significant that foundries in increasing numbers have been feeling the market for their requirements in the last half of the year.

An inquiry for 5000 tons of Southern basic iron at St. Louis follows considerable purchases by steel foundries there. In eastern Pennsylvania a sale of 10,000 tons of basic for third quarter was made at $17.75, delivered. In the Pittsburgh and Valley districts there is little inquiry for basic iron. Furnaces ask $16, while Bessemer iron can be had at $17.50 at furnace. The early blowing in of another Aliquippa furnace will make the Jones & Laughlin Steel Company practically independent of the pig iron market.

Our Pittsburgh report refers to offerings of several lots of Bessemer billets and sheet bars by consumers for resale through dealers as an element of weakness, but the supply of such steel is not large.

No further contracts for bars for implement works for the year beginning July 1 have come out. Important producers are holding at 1.45c., Pittsburgh, as minimum, and some sales were made recently on that basis for early delivery to manufacturers of agricultural machinery. It is some years since agricultural buyers have found the mills so little inclined to make concessions on these contracts.

Domestic rail sales are not noteworthy, but rail orders for foreign shipment reached the unusual aggregate of 70,000 tons last week, distributed among several mills. The largest interest sold 12,000 tons for shipment to Queensland.

Cars ordered last week amounted to 8200, and for March the total will exceed 20,000. The Steel Corporation is placing 46 locomotives for the Elgin, Joliet & Eastern Railroad and 1000 steel cars for its Union Railway.

The outlook in structural steel is excellent, but fabricating capacity is far beyond the present rate of new construction. Fabricators at Chicago are bidding on 50,000 tons of bridge work, of which the largest single inquiry is for 12,000 tons for the Northern Pacific. The Rothchild Department Store at Chicago will take 8000 tons. At St. Paul a new union depot will require a large amount of steel.

Little anxiety is felt over the disagreement at the conference of bituminous miners and operators at Cincinnati. In the Chicago district, in particular, consumers are well stocked, and in a number of districts in the Central West from 60 to 90 days' supply is being carried.

Indications are that March will establish a new record for shipments of finished products by the various subsidiaries of the United States Steel Corporation.

The scrap trade, which has been for weeks at a low state, has shown more life in the past week—a fact of some note in view of its sensitiveness to changes in the industry.

The leading producers of Lake Superior ore have announced an advance in wages averaging somewhat less than 10 per cent., effective April 1, establishing a higher level than has ever been known in that industry.

## A Comparison of Prices.

Mar.30, Mar.23, Feb.23, Mar.31,
**Declines in Italics.**
At date, one week, one month and one year previous.

| | Mar.30, 1910. | Mar.23, 1910. | Feb.23, 1910. | Mar.3, 1909. |
|---|---|---|---|---|
| **PIG IRON,** Per Gross Ton: | | | | |
| Foundry No. 2, standard, Philadelphia | *$18.00* | $18.00 | $18.50 | $16.25 |
| Foundry No. 2, Southern, Cincinnati | *15.75* | 16.25 | 16.75 | 14.25 |
| Foundry No. 2, local, Chicago | *18.00* | 18.25 | 19.00 | 16.50 |
| Basic, delivered, eastern Pa | *17.75* | 18.00 | 18.50 | 15.00 |
| Basic, Valley furnace | 16.00 | 16.00 | 16.00 | 14.50 |
| Bessemer, Pittsburgh | *18.40* | 18.40 | 18.90 | 15.90 |
| Gray forge, Pittsburgh | *16.15* | 16.15 | 16.90 | 14.40 |
| Lake Superior charcoal, Chicago | *19.00* | 19.00 | 19.50 | 19.50 |
| **BILLETS, &c.,** Per Gross Ton: | | | | |
| Bessemer billets, Pittsburgh | 27.50 | 27.50 | 27.50 | 23.00 |
| Forging billets, Pittsburgh | 32.00 | 32.00 | 32.00 | 25.00 |
| Open hearth billets, Philadelphia | 30.60 | 30.60 | 30.60 | 25.40 |
| Wire rods, Pittsburgh | 33.00 | 33.00 | 33.00 | 33.00 |
| Steel rails, heavy, at mill | 28.00 | 28.00 | 28.00 | 28.00 |
| **OLD MATERIAL,** Per Gross Ton: | | | | |
| Steel rails, melting, Chicago | **17.00** | 16.50 | 16.50 | 13.00 |
| Steel rails, melting, Philadelphia | 16.50 | 16.50 | 16.50 | 13.25 |
| Iron rails, Chicago | 19.00 | 19.00 | 19.00 | 16.00 |
| Iron rails, Philadelphia | **20.50** | 20.50 | 20.00 | 17.00 |
| Car wheels, Chicago | *17.00* | 17.00 | 17.50 | 14.50 |
| Car wheels, Philadelphia | 16.75 | 16.75 | 16.75 | 14.00 |
| Heavy steel scrap, Pittsburgh | **17.00** | 17.00 | 16.75 | 13.75 |
| Heavy steel scrap, Chicago | *15.00* | 15.00 | 15.25 | 12.00 |
| Heavy steel scrap, Philadelphia | 16.50 | 16.50 | 16.50 | 13.25 |
| **FINISHED IRON AND STEEL,** Per Pound: | Cents. | Cents. | Cents. | Cents. |
| Refined iron bars, Philadelphia | *1.55* | 1.55 | 1.60 | 1.37½ |
| Common iron bars, Chicago | *1.55* | 1.55 | 1.60 | 1.27½ |
| Common iron bars, Pittsburgh | *1.65* | 1.65 | 1.70 | 1.35 |
| Steel bars, tidewater, New York | *1.61* | 1.61 | 1.66 | 1.36 |
| Steel bars, Pittsburgh | *1.45* | 1.45 | 1.50 | 1.20 |
| Tank plates, tidewater, New York | 1.71 | 1.71 | 1.71 | 1.46 |
| Tank plates, Pittsburgh | 1.55 | 1.55 | 1.55 | 1.30 |
| Beams, tidewater, New York | 1.66 | 1.66 | 1.66 | 1.46 |
| Beams, Pittsburgh | 1.50 | 1.50 | 1.50 | 1.30 |
| Angles, tidewater, New York | 1.66 | 1.66 | 1.66 | 1.46 |
| Angles, Pittsburgh | 1.50 | 1.50 | 1.50 | 1.30 |
| Skelp, grooved steel, Pittsburgh | 1.50 | 1.50 | 1.50 | 1.25 |
| Skelp, sheared steel, Pittsburgh | 1.60 | 1.60 | 1.60 | 1.35 |
| **SHEETS, NAILS AND WIRE,** Per Pound: | Cents. | Cents. | Cents. | Cents. |
| Sheets, black, No. 28, Pittsburgh | 2.40 | 2.40 | 2.40 | 2.20 |
| Wire nails, Pittsburgh* | 1.85 | 1.85 | 1.85 | 1.95 |
| Cut nails, Pittsburgh | **1.85** | 1.85 | 1.80 | 1.80 |
| Barb wire, galv., Pittsburgh* | 2.15 | 2.15 | 2.15 | 2.40 |
| **METALS,** Per Pound: | Cents. | Cents. | Cents. | Cents. |
| Lake copper, New York | 13.75 | 13.75 | 13.75 | 13.00 |
| Electrolytic copper, New York | *13.25* | 13.37½ | 13.37½ | 12.62½ |
| Spelter, New York | *5.65* | 5.73 | 5.70 | 4.85 |
| Spelter, St. Louis | *5.50* | 5.58 | 5.55 | 4.70 |
| Lead, New York | *4.40* | 4.45 | 4.55 | 4.10 |
| Lead, St. Louis | *4.35* | 4.30 | 4.40 | 3.97½ |
| Tin, New York | **33.25** | 33.25 | 33.20 | 29.50 |
| Antimony, Hallett, New York | 8.25 | 8.25 | 8.25 | 7.75 |
| Nickel, New York | 45.00 | 45.00 | 45.00 | 45.00 |
| Tin plate, 100 lb., New York | $3.84 | $3.84 | $3.84 | $3.64 |

* These prices are for largest lots to jobbers.

## Prices of Finished Iron and Steel f.o.b. Pittsburgh.

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Paul, 32c.; St. Louis, 22½c.; New Orleans, 30c.; Birmingham, Ala., 45c. Rates to the Pacific Coast are 80c. on plates, structural shapes and sheets, No. 11 and heavier; 85c. on sheets, Nos. 12 to 16; 95c. on sheets No. 16 and lighter; 65c. on wrought pipe and boiler tubes.

**Structural Shapes.**—I-beams and channels, 3 to 15 in., inclusive, 1.50c. to 1.55c., net; I-beams over 15 in., 1.65c., net; H-Beams over 8 in., 1.75c.; angles, 3 to 6 in., inclusive, ¼ in. and up, 1.60c. net; angles over 6 in., 1.65c., net; angles, 3 x 3 in. and up, less than ¼ in., 1.75c., base, half extras, steel bar card; tees, 3 in. and up, 1.65c., net; zees, 3 in. and up, 1.60c., net; angles, channels and tees, under 3 in., 1.50c., base, plus 10c., half extras, steel bar card; deck beams and bulb angles, 1.80c., net; hand rail tees, 2.80c., net; checkered and corrugated plates, 2.80c., net.

**Plates.**—Tank plates, ¾ in. thick, 6¼ in. up to 100 in. wide, 1.55c. to 1.60c., base. Following are stipulations prescribed by manufacturers, with extras to be added to base price (per pound) of plates:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated February 6, 1903, or equivalent, ¼-in. thick and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per square foot are considered ¼-in. plates. Plates over 72 in. wide must be ordered ¼-in. thick on edge, or not less than 11 lb. per square foot, to take base price. Plates over 72 in. wide ordered less than 11 lb. per square foot down to the weight of 3-16-in. take the price of 3-16-in.

Allowable overweight, whether plates are ordered to gauge or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

| | |
|---|---|
| Gauges under ¼-in. to and including 3-16-in. on thinnest edge | $0.10 |
| Gauges under 3-16-in. to and including No. 8 | .15 |
| Gauges under No. 8 to and including No. 9 | .25 |
| Gauges under No. 9 to and including No. 10 | .30 |
| Gauges under No. 10 to and including No. 12 | .40 |
| Sketches (including all straight taper plates), 3 ft. and over in length | .10 |
| Complete circles, 3 ft. diameter and over | .20 |
| Boiler and flange steel | .10 |
| "A. B. M. A." and ordinary firebox steel | .20 |
| Still bottom steel | .30 |
| Marine steel | .40 |
| Locomotive firebox steel | .50 |
| Widths over 100 in. up to 110 in., inclusive | .05 |
| Widths over 110 in. up to 115 in., inclusive | .10 |
| Widths over 115 in. up to 120 in., inclusive | .15 |
| Widths over 120 in. up to 125 in., inclusive | .25 |
| Widths over 125 in. up to 130 in., inclusive | .50 |
| Widths over 130 in. | 1.00 |
| Cutting to lengths or diameters under 3 ft. to 2 ft., inclusive | .25 |
| Cutting to lengths or diameters under 2 ft. to 1 ft., inclusive | .50 |
| Cutting to lengths or diameters under 1 ft. | 1.55 |

No charge for cutting rectangular plates to lengths 3 ft. and over.

TERMS.—Net cash 30 days.

**Sheets.**—Minimum prices for mill shipments on sheets in carload and larger lots, on which jobbers charge the usual advances for small lots from store, are as follows: Black annealed sheets, Nos. 3 to 8, 1.70c.; Nos. 9 and 10, 1.75c.; Nos. 11 and 12, 1.80c.; Nos. 13 and 14, 1.85c.; Nos. 15 and 16, 1.95c. Box annealed sheets, Nos. 17 to 21, 2.20c.; Nos. 22 to 24, 2.25c.; Nos. 25 and 26, 2.30c.; No. 27, 2.35c.; No. 28, 2.40c.; No. 29, 2.45c.; No. 30, 2.55c. Galvanized sheets, Nos. 13 and 14, 2.50c.; Nos. 15 and 16, 2.60c.; Nos. 17 to 21, 2.75c.; Nos. 22 to 24, 2.90c.; Nos. 25 and 26, 3.10c.; No. 27, 3.30c.; No. 28, 3.50c.; No. 29, 3.60c.; No. 30, 3.85c. Painted roofing sheets, No. 28, $1.70 per square. Galvanized roofing sheets, No. 28, $3 per square, for 2½-in. corrugations.

**Wrought Pipe.**—The following are the discounts on the Pittsburgh basing card on carloads of wrought pipe which went into effect January 1:

| | Steel. Black. | Steel. Galv. | Iron. Black. | Iron. Galv. |
|---|---|---|---|---|
| ⅛ and ¼ in. | 70 | 54 | 65 | .. |
| ⅜ in. | 71 | 57 | 66 | 52 |
| ½ in. | 74 | 62 | 69 | 57 |
| ¾ to 6 in. | 78 | 68 | 73 | 63 |
| 7 to 12 in. | 72 | 57 | 67 | 52 |
| Plugged and Reamed. | | | | |
| 1 to 4 in. | 76 | 66 | 71 | 61 |
| Extra Strong, Plain Ends. | | | | |
| ⅛ to ⅜ in. | 63 | 51 | 58 | 46 |
| ½ to 4 in. | 70 | 58 | 65 | 53 |
| 4½ to 8 in. | 66 | 54 | 61 | 49 |
| 9, 10, 11 and 12 in. | 54 | 42 | .. | .. |
| Double Extra Strong, Plain Ends. | | | | |
| ½ to 8 in. | 59 | 48 | 54 | 43 |

The above steel pipe discounts are for "card weight," subject to the usual variation of 5 per cent.

**Boiler Tubes.**—Discounts on lap welded steel and charcoal iron boiler tubes to jobbers in carloads are as follows:

| | Steel. | Iron. |
|---|---|---|
| 1 to 1½ in. | 49 | 43 |
| 1¾ to 2¼ in. | 61 | 43 |
| 2½ in. | 63 | 48 |
| 2¾ to 5 in. | 69 | 53 |
| 6 to 13 in. | 61 | 43 |

2½ in. and smaller, over 18 ft., 10 per cent. net extra.
2¾ in. and larger, over 22 ft., 10 per cent. net extra.

Less than carloads to destinations east of the Mississippi River will be sold at delivered discount for carloads lowered by two points, for lengths 22 ft. and under; longer lengths, f.o.b. Pittsburgh.

**Wire Rods.**—Bessemer, open hearth and chain rods, $33.

**Steel Rivets.**—Structural rivets, ¾-in. and larger, 2.15c., base; cone head boiler rivets, ¾-in. and larger, 2.25c., base; ⅝-in. and 11-16-in. take an advance of 15c., and ½-in. and 9-16-in. take an advance of 50c.; in lengths shorter than 1 in. also take an advance of 50c. Terms are 30 days, net cash, f.o.b. mill. The above prices are absolutely minimum on contracts for large lots, makers charging the usual advances of $2 to $3 a ton to the small trade.

## Pittsburgh.

PARK BUILDING, March 30, 1910.—(*By Telegraph.*)

**Pig Iron.**—The market continues extremely quiet, inquiries being few and only for small lots. It is stated that some consumers, notably of foundry iron, have not entirely covered their requirements for the second quarter, and it is expected that a moderate buying movement may come early in April. All the large consumers of Bessemer and basic iron are pretty well covered for some time ahead, and the Jones & Laughlin Steel Company will start a third blast furnace at Aliquippa about April 10, so that this concern is probably in shape now to take care of its entire requirements of metal. Specifications against contracts for pig iron are being held up to some extent, and the whole market seems heavy. We quote Bessemer iron at $17.50; basic, $16 to $16.25; malleable Bessemer, $16.25 to $16.50; No. 2 foundry, $16 to $16.25, and gray forge, $15.25, all at Valley furnace, the freight to Pittsburgh being 90c. a ton.

**Steel.**—Here and there steel in the shape of billets and sheet and tin bars is being offered for resale through dealers by consumers at somewhat lower prices than the mills will name. Such sales of Bessemer sheet bars have been made at $28 or lower, but in small lots and for prompt shipment. We note a sale of 150 tons of 4 x 4 in. open hearth billets at $29, maker's mill, and a sale of 1000 tons of 4 x 4 in. Bessemer billets at $28, Pittsburgh. We quote Bessemer 4 x 4 in. billets at $27.50 to $28; Bessemer sheet and tin bars, $28.50 to $29; 4 x 4 in. open hearth billets, $29 to $29.50; open hearth small billets, $30.50 to $31; open hearth sheet and tin bars, $29.50 to $30, and forging billets, $32 to $33, Pittsburgh.

(*By Mail.*)

While local conditions in the steel trade are fairly satisfactory, it must be admitted that the new demand for iron and steel products and specifications against contracts are not as active as manufacturers would like to see. The demand for pig iron is also rather quiet, being only for small lots, but reports are current that Bessemer iron is being offered quite freely at $17.50 at Valley furnace, but even this low price does not seem to stimulate the demand. None of the large steel interests is inquiring for Bessemer or basic iron, but prices on basic are quite firm at $16, Valley furnace, some sellers holding their iron for $16.25 and $16.50. Southern No. 2 foundry is being freely offered in this market at $12.50, Birmingham, or $17.40, Pittsburgh, but this is higher than the prices quoted for Valley iron. In spots the prices of steel seem to be weaker, due to the offerings of fairly large lots of billets and sheet and tin bars by consumers for resale through dealers. The mills, however, are very firm in their prices, and within the past week Bessemer billets have sold at $28 and open hearth at $29, maker's mill. Specifications against contracts on finished iron and steel have been fairly heavy this month, but on some lines were not so good as in February. The scrap trade is showing more strength, but coke continues neglected.

**Ferrosilicon.**—A sale of two cars, or about 60 tons, of 50 per cent. for April, May and June shipment has been made on the basis of $62, Pittsburgh. Prices are firm, but most consumers are pretty well covered for the balance of this year. We quote 10 per cent. at $23.90; 11 per cent., $24.90; 12 per cent., $25.90, and 50 per cent., $62, Pittsburgh, for forward delivery.

**Ferromanganese.**—A sale of 75 to 100 tons for May and June delivery is reported at $42, Baltimore, or $43.95, Pittsburgh.

**Muck Bar.**—The inquiry for 500 tons noted last week is reported to have been closed on the basis of about $29, Pittsburgh. We quote best grades of muck bar, made from all pig iron, at $29 to $29.50, Pittsburgh.

**Rods.**—Small lots of Bessemer and open hearth rods, ranging from 50 to 100 tons, are being sold on the basis of $33, Pittsburgh, but it is probable that on a firm offer for a round lot, say 1000 to 1500 tons, a lower price would be made.

**Skelp.**—There is a fair amount of new inquiry. On

grooved and sheared iron skelp the mills are pretty well filled for several months ahead and prices are firm. For ordinary widths and gauges we quote grooved steel skelp at 1.50c. to 1.55c.; sheared steel skelp, 1.60c. to 1.65c.; grooved iron skelp, 1.80c., and sheared iron skelp, 1.90c., all f.o.b. mill, Pittsburgh.

**Plates.**—A good many new inquiries are in the market for cars, and some contracts have been placed. The Chesapeake & Ohio Railroad has ordered 500 more coal cars from the Pressed Steel Car Company, the same number from the Standard Steel Car Company, and 500 box cars from the American Car & Foundry Company. The Colorado Southern has ordered from the Pressed Steel Car Company 500 50-ton steel cars, and the Southern Railroad has ordered 2000 steel gondolas from the Western Steel Car & Foundry Company, which is owned by the Pressed Steel Car Company. The Cambria Steel Company has received a contract for 800 50-ton steel hopper cars from the Vandalia Railroad. The Pressed Steel Car Company is now running to full capacity, being entirely free from labor troubles, and expects to turn out 120 cars per day during April. One leading plate mill states that it is about 90 days behind in shipments. Current general orders are fairly heavy. The steel car plants, being well filled for the next three or four months, are certain to make heavy demands on the mills for plates and small shapes.

**Steel Rails.**—Three or four of the leading railroads are reported to have about made up their estimates of rails needed this year, and it is hoped that this business will develop in the near future. Current small orders for standard sections are fairly active, but large contracts are lacking. The demand for light rails continues strong, the Carnegie Steel Company having taken orders last week for upward of 3500 tons. We quote steel axles at 1.75c. to 1.80c. and splice bars, 1.50c., at mill, Pittsburgh. Light rail prices are as follows: 8 to 10 lb., $32; 12 to 14 lb., $29; 16, 20 and 25 lb., $28; 30 and 35 lb., $27.75, and 40 and 45 lb., $27, Pittsburgh. These prices are for 250-ton lots and over, and for small lots premiums of 50c. per ton and more are being paid. We quote standard sections at $28, at mill.

**Structural Material.**—The Jones & Laughlin Steel Company has taken 500 tons for an addition to the plant of the Consolidated Gas Company, Pittsburgh, and the McClintic-Marshall Construction Company about 400 tons for a new building for the Lebanon Valley Iron & Steel Company, Lebanon, Pa. While the mills are still back on deliveries to some extent, they are making better shipments than for some time, and competition for new work coming up is keen. Reports that plain material has been sold by local mills on the basis of 1.40c., at mill, are strongly denied.

**Tin Plates.**—The demand for tin plate for shipment in the second quarter continues fairly active, and on several orders recently placed for this delivery premiums of 10c. per box have been paid. The Jones & Laughlin Steel Company expects to start the first unit of 12 hot mills in its new tin plate plant at Aliquippa in the latter part of April, while the Phillips Sheet & Tin Plate Company is running eight of the 10 hot mills in its new plant at Weirton, W. Va., and will start the tin house in the latter part of April, the output in the meantime being black plate for tinning. The McKeesport Tin Plate Company is pushing work on 10 new hot mills at McKeesport, and expects to start a part of these mills next month. Prices are firm, and we quote 100-lb. cokes at $3.60 per base box, f.o.b. Pittsburgh, for forward delivery.

**Sheets.**—The favorable weather has already had the effect of bringing out a heavier demand for all kinds of sheets and the mills are entering more orders than for some time. Specifications against contracts are also coming in more freely, and shipments of sheets by the mills in March will show a large increase over February. The recent shading in prices of black and galvanized sheets of $2 to $3 a ton, which was being done only on sheets for prompt delivery, has about disappeared, the several mills that were making these concessions having taken on a good deal of tonnage. Blue annealed and electrical sheets still command premiums of $1 to $2 a ton for reasonably prompt shipment.

**Bars.**—Implement makers are in the market for their requirements on steel bars for the last half of this year and also for the whole year, commencing July 1 next. Some contracts have already been taken by the steel bar mills for these deliveries from favored customers and on desirable contracts on the basis of 1.40c., Pittsburgh, and it is probable that additional large contracts will be placed in the near future. There is a slight weakness in prices of iron bars, and while the local market is about 1.65c., it is stated that this price might be shaded on desirable tonnage. We continue to quote steel bars at 1.45c. on current orders and 1.50c. for reasonably prompt shipment. We quote iron bars at 1.65c., Pittsburgh, with freight to destination added.

**Hoops and Bands.**—There has been some betterment in new orders, and mills state that specifications against contracts so far this month have shown an increase over February. We quote steel hoops for forward delivery at 1.50c. to 1.60c., and for prompt shipment at 1.60c. to 1.65c., at mill. Steel bands are 1.45c. to 1.50c., on contracts, and from 1.60c. to 1.65c. for prompt shipment.

**Spelter.**—The market continues dull, with prime grades of Western held at 5.40c., East St. Louis, or 5.52½c., Pittsburgh.

**Spikes.**—Three or four of the Western railroads have come in the market recently with fairly large inquiries for spikes, two for 4000 kegs each. Makers of spikes are only fairly busy, the demand not being as heavy as was expected that it would be at this time. We quote standard sizes of railroad spikes, 4½ x 9-16 in. and larger, at $1.70 for Western shipment and $1.75 for local trade. Boat spikes are firm at $1.75, base, and small railroad spikes at $1.75, base. These prices are for carload and larger lots.

**Shafting.**—Current demand for shafting continues fairly heavy and specifications against contracts are being received at a very satisfactory rate. Discounts are being maintained on shafting on the basis of 55 per cent. off in carloads, and 50 per cent. in less than carloads, delivered in base territory.

**Rivets.**—The demand for rivets has shown material betterment lately, and makers are entering more new orders than for some time.

**Wire Products.**—Delayed specifications against contracts for wire and cut nails and also for wire are now being received by the mills from the jobbers, indicating that jobbers' stocks are moving out freely. We quote wire nails at $1.85 in carload and larger lots; painted barb wire, $1.85; galvanized, $2.15; annealed fence wire, $1.65; galvanized, $1.95, and cut nails, $1.85, all f.o.b. cars, Pittsburgh, usual terms, with full freight to destination added.

**Merchant Pipe.**—Advices are that the large stocks of pipe held by the jobbers are at last commencing to move out, and the mills anticipate an increase in new demand in the near future. The pipe trade is not in as satisfactory condition as desired, both the mills and the jobbers having been carrying heavy stocks. The outlook for the laying of large gas and oil lines this year is not quite so favorable, owing to the trouble some of the gas and oil companies are having in financing their bonds. Specifications against contracts for pipe during March have only been fairly satisfactory.

**Boiler Tubes.**—The demand for both locomotive and merchant tubes is showing some betterment, but is not as heavy as expected. It is believed, however, that a material increase in new orders, especially for locomotive tubes, will come in the near future.

**Coke.**—No additional contracts for furnace coke have been closed since those noted in this report last week, and we do not hear of any new inquiries. The general coke trade is in unsatisfactory condition, and it is claimed that in some cases both furnace and foundry coke is being sold at lower prices than it can be made. We quote standard makes of furnace coke running less than 1 per cent. in sulphur at $2.10 to $2.15 per net ton, at oven, while outside makes of furnace coke running higher than 1 per cent. are as low as $1.60 per net ton, at oven. We quote best makes of 72-hour foundry coke for current orders at $2.85 to $3 per net ton, at oven, but on a large inquiry it is probable that as low as $2.60 could be done.

**Iron and Steel Scrap.**—While the tone of the market is firm, the amount of scrap actually being sold by dealers to consumers is relatively small. The demand for heavy steel scrap is fairly active, and reports are that several sales have been made for delivery to consumers outside the Pittsburgh district at $17.25, delivered. As long as pig iron continues dull in demand and weak in price it is not believed that there will be much betterment in the prices of scrap. Dealers quote about as follows, per gross ton, for delivery at Pittsburgh or elsewhere, as noted:

| | | |
|---|---|---|
| Heavy steel scrap, Steubenville, Follansbee, Monessen and Pittsburgh | $17.00 to | $17.25 |
| Heavy steel scrap, Sharon, Pa., delivery | | 16.50 |
| No. 1 foundry cast | 16.50 to | 16.75 |
| No. 2 foundry cast | 15.25 to | 15.50 |
| Bundled sheet scrap, at point of shipment | 14.00 to | 14.25 |
| Rerolling rails, Newark and Cambridge, Ohio, and Cumberland, Md. | 18.00 to | 18.25 |
| No. 1 railroad malleable scrap | 16.00 to | 16.25 |
| Grate bars | 12.50 to | 12.75 |
| Low phosphorus melting stock | .... to | 21.00 |
| Iron car axles | 26.50 to | 27.00 |
| Steel car axles | 24.00 to | 24.25 |
| Locomotive axles | 27.50 to | 28.00 |
| No. 1 busheling scrap | 14.50 to | 14.75 |
| No. 2 busheling scrap | 11.00 to | 11.25 |
| Old car wheels | 17.00 to | 17.25 |
| Sheet bar crop ends | 17.25 to | 17.50 |
| Cast iron borings | 9.75 to | 10.00 |
| Machine shop turnings | 12.00 to | 12.25 |

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The offices of C. Dreifus & Co., dealers in iron and steel scrap, have been removed from the Frick Building to suite 1624 Henry W. Oliver Building, Pittsburgh.

The offices of Banning, Cooper & Co., Ltd., iron and steel factors, have been removed from the Lewis Block to rooms 406-409 Henry W. Oliver Building, Pittsburgh.

The offices of the Jamison Coal & Coke Company have

been removed from the Frick Building Annex to the fifteenth floor of the Henry W. Oliver Building, Pittsburgh.

## Chicago.

FISHER BUILDING, March 30, 1910.—(*By Telegraph.*)

The cessation of coal mining in Illinois, Indiana, Ohio and other territory controlled by the miners' union attracts but little attention in the market or in business circles in the West. Industrial consumers have generally made provision for their needs for 60 to 90 days, dealers' stocks are ample to cover the retail consumption and the railroads have provided large stocks. The by-product coke produced here is from West Virginia coal, which is not affected by the controversy, and other coke supplies are also from nonunion territory. The supply of coal on cars or in transit would cover all consumptive needs for 30 days, and the other available stocks will carry the country for 60 to 90 days or even longer. The operators have had a profitable winter after several years of unsatisfactory business, and are not averse to making a profit on coal in transit. The miners have had a busy winter with good wages, and the question of a settlement may not be seriously considered for 30 days. A few large consumers whose stocks are light may have to pay a premium meantime, but otherwise industrial conditions are not affected. Business continues to improve in the steel industry. Structural business is coming forward better and there are large projects in prospect which are of more interest to the leading fabricators than the current run of small structural contracts. Eastern structural mills are taking a good volume of business from fabricators, car shops and railroads for plain material. It is generally recognized now that the bar mills are sold ahead for six months on soft steel bars, and the bar iron mills are getting more new business as well as the mills rolling hard steel. The demand from store for bars and miscellaneous forms of steel grows larger each month, and Chicago houses are unable to take care of inquiries which come from all parts of the country. In wire products the jobbers are depleting their stocks and placing new orders with the mills, although it was supposed last winter that the jobbing trade was overstocked. Manufacturers who sell the agricultural trade anticipate another record breaking year. There is a little more activity in scrap, but the consumptive demand for metals is quiet.

**Pig Iron.**—A further recession in prices in both Northern and Southern iron has awakened a little more interest among buyers. Several sales of round lots have been made. There are many inquiries in the market for all grades of iron, but buyers are pursuing a listless and indifferent policy, expecting lower prices. On an inquiry which was reported last week a radiator interest has bought 7500 tons of Southern foundry for last half. A manufacturer west of Chicago has taken 2500 tons of Southern foundry, and there have been other scattering sales. Chicago is now recognized as the weakest market for Southern iron, and an Ohio buyer recently inquired here for 4000 tons of Southern forge, which he obtained at a concession. The majority of the Southern furnaces are now asking $13, Birmingham, for No. 2 for second quarter and most of them are willing to make this price through the year, but there is enough No. 2 iron to be had at $12.50 to make that the market for April shipment, and concessions from this price can be had on analysis and resale iron. On Northern iron prices have receded again, making a decline of $1 during March in the prices quoted in this correspondence for Northern foundry and malleable Bessemer. This decline has come chiefly through transactions outside of Chicago. A Racine foundry, which recently bought 2000 tons of malleable, has taken an additional 1000 tons, and another foundry northwest of Chicago has taken 3000 tons. There are scattering sales of 500-ton lots of foundry and malleable and a local furnace recently sold 2000 tons of basic at a premium over foundry grades. The market for high silicon iron is unsettled, the furnaces making special prices on any attractive business. The following quotations are for April, May and June shipment, Chicago delivery:

| | |
|---|---|
| Lake Superior charcoal | $19.00 to $19.50 |
| Northern coke foundry, No. 1 | 18.50 to 19.00 |
| Northern coke foundry, No. 2 | 18.00 to 18.50 |
| Northern coke foundry, No. 3 | 17.50 to 18.00 |
| Northern Scotch, No. 1 | 19.00 to 19.50 |
| Southern coke, No. 1 | 17.10 to 17.60 |
| Southern coke, No. 2 | 16.85 to 17.35 |
| Southern coke, No. 3 | 16.60 to 17.10 |
| Southern coke, No. 4 | 16.35 to 16.85 |
| Southern coke, No. 1 soft | 17.10 to 17.60 |
| Southern coke, No. 2 soft | 16.85 to 17.35 |
| Southern gray forge | 16.10 to 16.60 |
| Southern mottled | 15.85 to 16.35 |
| Malleable Bessemer | 18.00 to 18.50 |
| Standard Bessemer | 19.90 to 20.40 |
| Jackson Co. and Kentucky silvery, 6% | 20.40 to 20.90 |
| Jackson Co. and Kentucky silvery, 8% | 21.40 to 21.90 |
| Jackson Co. and Kentucky silvery, 10% | 22.40 to 22.90 |

(*By Mail.*)

**Billets.**—The supply of billets from Eastern mills is becoming a little more regular and prices are ruling steadier around $31, Chicago, base, for rolling billets, with the usual differential for forging billets.

**Rails and Track Supplies.**—No orders were taken by the leading interest in Chicago last week for standard sections. The Chicago mills are unable to take business now for earlier delivery than the third quarter. The Bessemer mill at the South Works is running full. The open hearth mill at Gary is running at less than half its possible rolling capacity, but its operation is limited by the supply of crude steel, which must be divided with the billet mill. The two merchant mills which are now operating require 15,000 to 20,000 tons of billets per month, and other finishing departments of the leading interest in the West use all the billets they can obtain from Gary. There is the usual run of orders for light rails and new business in track supplies is coming forward steadily. We quote standard railroad spikes at 1.85c. to 1.95c., base; track bolts, with square nuts, 2.40c. to 2.60c., base, all in carloads, Chicago. Light rails, 40 to 45 lb., $27; 30 to 35 lb., $27.75; 16, 20 and 25 lb., $28; 12 lb., $29, Chicago.

**Structural Material.**—The railroads centering at St. Paul, Minn., have all approved the project for a new union station and terminal, which will require a large tonnage of fabricated material. The only question to be settled before letting contracts is whether to have a bridge across the Mississippi in connection with the terminal or to change the channel of the river and fill in a portion of its bed for terminal trackage, as some of the roads are not satisfied with the trackage available in connection with the bridge project. In Chicago the fabricators have received plans for a new building for the Rothschild department store, which will require about 8000 tons. Estimates are under way for the new building for the Hillman store, the Mandels have a new building under contract, and the second half of the Boston store is under construction. When these projects are completed all of the eight large department stores on State street will have fireproof steel buildings. The contracts let last week in the West show a little improvement. A theatre and office building for the Corner Realty Company, St. Louis, 545 tons, went to Noelke-Richards Company, Indianapolis. The Monroe street bridge, Spokane, Wash., 400 tons, went to the Riter-Conley Company, Pittsburgh. The Chester Building, Seattle, Wash., 500 tons, went to Millikin Brothers. A power house for the Omaha Light, Power & Railway Company, 1000 tons, went to the Wisconsin Bridge Company. New shops for the M. Rumely Company, La Porte, Ind., 800 tons, will be built by the Central States Bridge Company, Indianapolis. The Moon garage in Chicago, about 100 tons, has been relet to the American Bridge Company. This company also has taken the contract for the Foster Building at Denver, Colo., 1200 tons, and will fabricate 26,000 tons for the plant of the Minnesota Steel Company, a subsidiary of the United States Steel Corporation. A Davenport, Iowa, interest has specified about 5000 tons of plain material from an Eastern mill for car under frames. The fabricators have bids pending on about 50,000 tons of ordinary bridge work for Western railroads. We quote plain material from mill, 1.73c. to 1.78c., Chicago; from store, 2c., Chicago.

**Plates.**—The plate mills are filling up with specifications from car builders, and there is also a good current demand for tank and light plates, in which Eastern mills are doing a very satisfactory business in this market. We quote mill prices at 1.73c. to 1.78c., Chicago; store prices, 2c., Chicago.

**Sheets.**—There is a good current demand and the local mill now has more specifications on its books than on January 1. Additional mills will be ready to take care of this business as soon as the steel is available from the new open hearth furnaces which are nearing completion. We quote as follows, Chicago: No. 10 annealed, 1.93c.; No. 28 black, 2.58c.; No. 28 galvanized, 3.68c. Prices from store, Chicago, are: No. 10 blue annealed, 2.25c. to 2.35c.; No. 28 black, 2.90c. to 3c.; No. 28 galvanized, 4c. to 4.10c.

**Bars.**—The bar iron mills are getting more new business. Western railroads which had made contracts last fall for their first half requirements are placing additional orders and there is also more new business from other sources. The mills rolling hard steel bars are active bidders for old rails and are keeping the price of this material $1.50 to $2 above the margin which formerly prevailed between melting steel and old rails. In soft steel bars the situation is the same old story. The jobbers could do more business from store if they could get shipments on their mill orders. Industrial buyers watch the mills closely and pounce upon any gap in rolling schedules which permits them to get soft steel bars for prompt or early shipment. It is understood from reports current in this market that many of the Eastern mills are sold ahead on bars for about six months, or as far as the Western mills. The concrete bar business is becoming quite a factor in the trade and represents a considerable share of the new business which the mills are taking. Soft steel bars, 1.63c. to 1.68c.; bar iron, 1.55c. to 1.60c.; hard steel bars rolled from old rails, 1.55c. to 1.60c., all Chicago.

**Rods and Wire.**—The industrial demand continues very active and deliveries are better, as the railroads are now

able to furnish all the cars needed and give better service in transit. In the jobbing trade there is a surprising amount of new business, as jobbers who have carried large stocks are finding that the demand is larger than they expected and their stocks are becoming depleted. Talk of higher prices is being heard again. At the beginning of the year a general advance in wire products was scheduled for some time in February, but did not materialize. An independent interest, which has wire mills under construction in the Pittsburgh district, is expected to become an active factor in the trade in September, and this may have some effect on the course of prices. Jobbers only buy for 60 days' requirements, but industrial buyers in this market are generally covered to July 1. We quote Bessemer, open hearth and chain rods at $36, Chicago. Jobbers' carload prices, which are quoted to manufacturing buyers, are as follows: Plain wire, No. 9 and coarser, base, 1.83c.; wire nails, 2.03c.; painted barb wire, 2.03c.; galvanized, 2.33c., all Chicago.

**Merchant Steel.**—The demand for smooth machinery steel is so urgent that it is difficult to arrange satisfactory deliveries. Trade from store in tool steel is very brisk. The unusual demand for shipments from store of all forms of steel continues unabated. Large orders from store have been received in Chicago from the Pacific Coast as well as from Canada, and shipments cannot be obtained from the mills fast enough to keep up with the demand from all channels of trade. It is estimated that sales from store in Chicago, on less than carload shipments, would have been 10,000 tons larger during March if stocks had been available to take care of the business.

**Cast Iron Pipe.**—Milwaukee, Wis., will buy 3000 tons of water pipe this week, and other lettings of attractive size are expected in the near future. Prices on current business remain unchanged. On current business we quote, per net ton, Chicago, as follows: Water pipe, 4-in., $28.50; 6 to 12 in., $27.50; 16-in. and up, $26.50, with $1 extra for gas pipe.

**Old Material.**—There is a little better feeling among the scrap dealers, who find it easier to place the material which they have in transit. Rerolling rails are in good demand and steel scrap is easier to place with consumers. Car axles are scarce and taken eagerly by rolling and forging mills which can use them. The No. 1 railroad scrap, which is offered by railroads on their lists, has been selling steadily around $15 for a month or more, with switching charges to be added in most cases to make a delivered price. All this time, however, there has been more or less spot material of the same grade in the hands of dealers, who have not been able to realize more than $14.50. The difference in price may be due to some extent to the fact that railroad material does not arrive for 30 to 60 days, and is thus a future transaction, while the spot material is actually on track and must be moved promptly. The market for spot material has grown a little firmer, however, and No. 1 busheling is also quoted higher this week. Activity in steel foundries making castings for freight cars is reflected in the better demand for old couplers, knuckles and springs, as well as for old rails less than 3 ft. Cast scrap is softer, but malleable is firm. Heavy steel turnings continue to bring good prices, as they are the favorite medicine of the foundry chemist. The Rock Island offers a fair tonnage this week, and the Chicago & Northwestern also has a list of moderate size. The following prices are per gross ton, delivered, Chicago:

| | |
|---|---|
| Old iron rails | $19.00 to $19.50 |
| Old steel rails, rerolling | 18.00 to 18.50 |
| Old steel rails, less than 3 ft | 17.00 to 17.50 |
| Relaying rails, standard sections, subject to inspection | 24.00 to 25.00 |
| Old car wheels | 17.00 to 17.50 |
| Heavy melting steel scrap | 15.00 to 15.50 |
| Frogs, switches and guards, cut apart | 15.00 to 15.50 |
| Shoveling steel | 14.50 to 15.00 |

The following quotations are per net ton:

| | |
|---|---|
| Iron angles and splice bars | $17.00 to $17.50 |
| Iron car axles | 21.50 to 22.00 |
| Steel car axles | 23.00 to 24.00 |
| No. 1 railroad wrought | 14.75 to 15.25 |
| No. 2 railroad wrought | 13.75 to 14.25 |
| Springs, knuckles and couplers | 14.25 to 14.75 |
| Locomotive tires, smooth | 18.50 to 19.00 |
| No. 1 dealers' forge | 12.00 to 12.50 |
| Steel axle turnings | 11.00 to 11.50 |
| Machine shop turnings | 9.75 to 10.25 |
| Cast and mixed borings | 6.50 to 7.00 |
| No. 1 busheling | 12.50 to 13.00 |
| No. 2 busheling | 9.50 to 10.00 |
| No. 1 boilers, cut to sheets and rings | 11.00 to 11.50 |
| No. 1 cast scrap | 14.50 to 15.00 |
| Stove plate and light cast scrap | 12.50 to 13.00 |
| Railroad malleable | 14.50 to 15.00 |
| Agricultural malleable | 13.00 to 13.50 |
| Pipes and flues | 11.00 to 11.50 |

**Metals.**—The consumptive demand has been rather quiet in all the new metals, with practically no change in prices except on spelter, on which carload buyers can do a shade better than the price quoted last week. Large consumers who buy spelter in round lots have been able to do a little better than 5.50c., Chicago, but the market is erratic and uncertain. We quote Chicago prices as follows: Casting copper, 13⅝c.; lake, 13⅞c., in carloads, for prompt shipment; small lots, ¼c. to ⅜c. higher; pig tin, car lots, 33c.; small lots, 35c.; lead, desilverized, 4.50c. to 4.60c., for 50-ton lots; corroding, 4.75c. to 4.85c., for 50-ton lots; in carloads, 2½c. per 100 lb. higher; spelter, 5.60c. to 5.70c.; Cookson's antimony, 10⅜c., and other grades, 9¾c. to 10¼c.; sheet zinc is $7.75, f.o.b. La Salle, in carloads of 600-lb. casks. On old metals we quote: Copper wire, crucible shapes, 13¾c.; copper bottoms, 12c.; copper clips, 13½c.; red brass, 12¾c.; yellow brass, 10c.; light brass, 7c.; lead pipe, 4½c.; zinc, 5.25c.; pewter, No. 1, 23c.; tin foil, 26c.; block tin pipe, 28c.

## Philadelphia.

PHILADELPHIA, PA., March 29, 1910.

A trifle better movement in crude materials is reported, particularly in purchases for delivery beyond mid-year, basic iron, at prices a shade under recent quotations, figuring largely in this connection. Finished makers are taking on a somewhat larger aggregate tonnage, and from the business in sight, originating principally with car, locomotive, bridge and boat builders, look forward to more active conditions in the near future. The old material market, while sentimentally stronger, continues dull. The coke movement is light, with prices easy. The labor situation, as far as the iron and steel trades are concerned, is much simplified. The general strike was officially called off March 28, although the greater proportion of the workmen had previously returned to work. The proposed State-wide strike was abandoned by the labor leaders as an unwise move.

**Pig Iron.**—Further sales of basic iron are announced, the most important transaction being one of 10,000 tons for third-quarter at $17.75, delivered. Small odd lots for spot shipment are offered at inside prices, but such transactions are kept extremely quiet. There is still some inquiry for third-quarter basic, one large block being under negotiation, although the consumers are fairly well covered for requirements during the next three or six months. An occasional inquiry for low phosphorus iron is reported, but no sales of importance are announced. Foundry iron sales have not been heavy. Small lots of standard brands of both Northern and Virginia No. 2 X foundry have been sold at prices ranging from $18 to $18.50, delivered in this territory, shipment varying from prompt to second quarter, with quotations dependent on tonnage and brand. In some few instances sellers will shade the inside figure for April shipment. Cast iron pipe makers are still in the market for low grade iron for second-quarter delivery. The principal inquiry before the trade last week has, it is said, been covered by a purchase of Southern iron. Producers have recently been maintaining prices more firmly on pipe grades, and buyers and sellers are about 50 cents apart in their views. There has been a little more inquiry for the higher grades of foundry iron for forward delivery, particularly from New England consumers, and some business of this character has been done, for deliveries extending over the remainder of the year, at the same range of prices as has been accepted for second quarter. Few large inquiries for forward delivery have developed; one for 1000 tons has come out, but the bulk of the demand appears to be for small lots. A sale of 1500 tons of forge iron to a rolling mill at $16.75, delivered, has been made. Prices are not particularly strong, quotations being largely dependent on individual conditions. For second-quarter delivery in buyers' yards in this vicinity the following range about represents the market:

| | |
|---|---|
| Eastern Pennsylvania, No. 2 X foundry | $18.00 to $18.50 |
| Eastern Pennsylvania, No. 2 plain | 17.50 to 18.00 |
| Virginia, No. 2 X foundry | 18.00 to 18.50 |
| Virginia, No. 2 plain | 17.75 to 18.25 |
| Gray forge | 16.75 to 17.00 |
| Basic | 17.75 to 18.25 |
| Standard low phosphorus | 23.00 to 23.50 |

**Ferromanganese.**—In the absence of business quotations are nominal, ranging from $42 to $42.50, Baltimore, according to tonnage and delivery.

**Billets.**—A continued good demand is experienced for moderate lots for second quarter delivery. Greater interest is being shown in second half business, but no quotations have been made by the leading producers for such delivery. Mills are very busy, and quotations for ordinary open hearth rolling billets are firm at $30.60, delivered in this territory during the second quarter. For the same delivery forging billets command $32 to $34, Eastern mill, dependent on quantity and analysis.

**Plates.**—A large amount of fresh business is in sight, particularly from the car builders. The demand for boiler and tank steel is also said to be very promising, and the trade looks forward to increasing activity. Eastern mills, while not as fully engaged as those in the West, are holding prices firm, and while 1.70c., delivered in this territory, can be done for ordinary plates for reasonable shipment, 1.75c. is the minimum quotation of some producers, except for extra desirable business, or where competition is very sharp.

**Structural Material.**—While a number of fair sized

propositions are being figured on, no contracts covering any considerable tonnage have been placed. Specifications continue to come out freely, however, and mills are fairly well engaged, although deliveries on plain shapes can now be had with reasonable promptness. Fabricated prices continue to show weakness. For delivery in this territory plain structural shapes are quoted at 1.70c. to 1.75c., dependent on specification.

**Sheets.**—The demand continues active on practically all sizes and classes. Mills are busily engaged and enter the second quarter with order books in very satisfactory shape. Makers still refuse to accept business except for near future delivery, for which the following range of prices is firmly maintained: Nos. 18 to 20, 2.80c.; Nos. 22 to 24, 2.90c.; Nos. 25 and 26, 3c.; No. 27, 3.10c.; No. 28, 3.20c.

**Bars.**—Orders for steel bars, on which, however, delivery usually runs from four to five months, have been taken at 1.60c., delivered in this territory. Refined iron bar makers report less active conditions, and in some instances specifications have been coming out less freely. Current orders are largely of a miscellaneous character for near future delivery. Prices of refined iron bars, while unchanged, are not particularly strong, ranging, according to specifications, from 1.55c. to 1.65c., delivered in this territory.

**Coke.**—The market is unsatisfactory. Consumers purchase for immediate and near future requirements as a rule, and prices, while practically unchanged, are not strong. Standard Connellsville furnace coke is quoted from $1.75 to $2, at oven, for early delivery. Foundry coke for prompt shipment can be had as low as $2.50, at oven, but the range for good brands is nearer $2.75 to $3.25, at oven. The following range of prices per net ton is named for deliveries in this vicinity:

| | |
|---|---|
| Connellsville furnace coke | $4.00 to $4.25 |
| Foundry coke | 4.75 to 5.50 |
| Mountain furnace coke | 3.60 to 3.85 |
| Foundry coke | 4.35 to 5.10 |

**Old Material.**—The sentimental tone of the market is better, but it has not yet been confirmed by any great amount of business. The movement in rolling mill grades has been less pronounced. A little more interest in heavy melting steel has, however, been shown, principally by purchasers outside the associated steel mills, sales of several small lots, as well as one of 1000 tons, being reported. It is interesting to note that one of the mills identified with the associated buying arrangement has given notice that all shipments on that account be discontinued after March 31 and that, pending further arrangements, its buying will be done in the open market. This interest has already purchased some 1500 tons of heavy melting steel at prices ranging from $16.50 to $17, delivered. Prices generally have not yet reached a firm basis and on many grades quotations are nominally given. The following range about represents the market for early delivery in buyers' yards, eastern Pennsylvania and nearby points:

| | |
|---|---|
| No. 1 steel scrap and crops | $16.50 to $17.00 |
| Old steel rails, rerolling | 17.75 to 18.25 |
| Low phosphorus | 22.00 to 22.50 |
| Old steel axles | 22.00 to 23.00 |
| Old iron axles | 28.00 to 28.50 |
| Old iron rails | 20.50 to 21.50 |
| Old car wheels | 16.75 to 17.25 |
| No. 1 railroad wrought | 19.50 to 20.00 |
| Wrought iron pipe | 16.00 to 16.50 |
| No. 1 forge fire | 14.50 to 15.00 |
| No. 2 light iron | 10.00 to 10.50 |
| Wrought turnings | 12.50 to 13.00 |
| Cast borings | 11.00 to 11.50 |
| Machinery cast | 16.00 to 16.50 |
| Railroad malleable | 16.00 to 16.50 |
| Grate bars | 13.75 to 14.25 |
| Stove plate | 12.00 to 12.50 |

## Cincinnati.

CINCINNATI, OHIO, March 30, 1910.

March closes with a substantial increase of interest shown by buyers in all lines save old material, which is drifting along without appreciable change. Some aggressive circularizing is in progress by concerns marketing coke, and anticipating the last half buying for furnace consumption particularly, there are apt to be some low prices made. In machinery circles March is quite up to expectations and the inquiries suggest a good April record. Specifications on contracts are good.

**Pig Iron.**—Reports indicate that some very low prices have been made for the delivery of foundry over the last half to Michigan stove makers who pooled issues in buying. These reports indicate that $13, Birmingham, for No. 2 was shaded from 25 to 50 cents per ton. There is confirmation for the reported price of $12.50, Birmingham, on No. 2 foundry for prompt and first half delivery, and even for delivery into third quarter, but some leading Alabama producers continue to maintain $13 as their minimum price for last half.. Inquiries for foundry iron range from a few carloads to 1000 tons. Basic, malleable and special irons have been the best sellers in this market the past week. One 5000-ton lot of the former was contracted for delivery in the Cincinnati district at $16.25. Another steel maker in this territory has bought a heavier tonnage at attractive prices and from nearby furnaces with a low freight rate. Malleable is in demand and inquiries will aggregate 15,000 to 20,000 tons, of which considerable for shipment into Northwest territory has been satisfied. Another malleable buyer wants 3000 tons, while one in Illinois asks for 500 to 1000 tons. A large car building interest is feeling the market for both foundry and malleable. A large steel making interest in Northern territory has bought some special iron, about 1000 tons, running 0.035 and under in both phosphorus and sulphur. An order came in to-day for a small lot of ferromanganese, 80 per cent., quoted at $41, New Orleans. Many foundries are preparing to cover their needs for last half, believing the market has reached bottom. The high silicon situation does not seem to improve; few sales are reported, and none at the established schedule. Pipe companies are reported to be figuring on considerable No. 4 foundry and forge on which there seems to be no settled price, ranging from $11.50, Birmingham, on forge, to $12.25 on No. 4 foundry. For prompt delivery and into third quarter, based on freight rates of $3.25 from Birmingham and $1.20 from Ironton, we quote f.o.b. Cincinnati as follows:

| | |
|---|---|
| Southern coke, No. 1 foundry | $16.25 to $16.75 |
| Southern coke, No. 2 foundry | 15.75 to 16.25 |
| Southern coke, No. 3 foundry | 15.25 to 15.75 |
| Southern coke, No. 4 foundry | 15.00 to 15.25 |
| Southern coke, No. 1 soft | 16.25 to 16.75 |
| Southern coke, No. 2 soft | 15.75 to 16.25 |
| Southern gray forge | 14.75 to 15.00 |
| Ohio silvery, 8 per cent. silicon | 20.20 |
| Lake Superior coke, No. 1 | 17.70 |
| Lake Superior coke, No. 2 | 17.20 |
| Lake Superior coke, No. 3 | 16.70 |
| Standard Southern car wheel | 25.25 to 25.75 |
| Lake Superior car wheel | 22.25 to 22.75 |

(*By Mail.*)

**Coke.**—There are evidences of lively competition for business, particularly in Wise County. Shipments on contracts are fair. Some little contracting for the last half is noted. Standard Connellsville furnace grades for early shipment are quoted at $2 to $2.25 per net ton at oven and on contract $2.25 to $2.40. Connellsville foundry ranges from $2.40 to $3 for spot and $2.75 to $3 for forward delivery. Pocahontas foundry grades for early delivery range from $2.65 to $2.75, and on contract $2.75 to $3. Wise County furnace is quotable at $1.85 to $2 and some business for the last half is in negotiation. Wise County foundry brands are quotable at $2.50 to $2.75 for early and $2.75 to $3 for the last half.

**Finished Iron and Steel.**—A better movement out of stock on all structural material is noted, as the open weather has stimulated building. In sheets the leading interest is booking business for last half on manufacturers' specifications and selling to jobbers into third quarter, but, it is understood, not beyond. Independent mills in this territory are also booking business, it is reported, in the same manner. On steel bars, for shipment over the last half, 1.45c., Pittsburgh, has been done, but for current and ordinary business the price is 1.50c. to 1.55c., Pittsburgh. Iron bars are quotable at about 1.60c. to 1.65c., delivered, Cincinnati. Twisted steel bars for concrete work are quotable at 2c., base, Cincinnati, for ¾-in. and larger.

**Old Material.**—Dealers announce business very quiet, but are stocking up on bargain lots picked up from railroads and other sources. The railroads of this section are offering nothing this week. Relayers are in demand and seem to be scarce. They are held rather firmly at about $23, Cincinnati, for 56-lb. and up. Mills are buying nothing, and in the absence of business the quotations given are nominal and those that ruled in latest transactions. We quote as follows, f.o.b. Cincinnati and southern Ohio yards:

| | |
|---|---|
| No. 1 railroad wrought, net ton | $13.50 to $14.00 |
| Cast borings, net ton | 7.00 to 7.50 |
| Heavy melting steel scrap, gross ton | 14.00 to 14.50 |
| Steel turnings, net ton | 9.00 to 9.50 |
| No. 1 cast scrap, net ton | 12.50 to 13.00 |
| Burnt scrap, net ton | 9.00 to 10.00 |
| Old iron axles, net ton | 18.00 to 18.50 |
| Old iron rails, gross ton | 17.50 to 18.00 |
| Old steel rails, short, gross ton | 15.00 to 15.50 |
| Old steel rails, long, gross ton | 16.00 to 16.50 |
| Relaying rails, 56 lb. and up, gross ton | 23.00 to 24.00 |
| Old car wheels, gross ton | 14.00 to 14.50 |
| Low phosphorus scrap, gross ton | 17.00 to 17.50 |

Day Williams of Hickman, Williams & Co.'s Chicago office, goes to St. Louis for that firm. He is succeeded in Chicago by Eugene R. Staat. Howard Tracy, well known in the fuel selling trade, has been placed in charge of the coke business of Hickman, Williams & Co., all territories, with headquarters in the Cincinnati office.

Clifford N. Brownson has been placed in charge of the Domhoff & Joyce Company's coke selling interests, with headquarters at Cincinnati.

The Otis Elevator Company has increased its capital stock from $13,000,000 to $16,500,000.

## Cleveland.

CLEVELAND, OHIO, March 29, 1910.

**Iron Ore.**—Indications point to an early opening of navigation. The boats of the Pittsburgh Steamship Company and of some other ore shippers will be ready to sail April 15, and although no date has been set for the starting of the lake fleet, a large number of boats will probably be placed in commission soon after the middle of April. Some of the merchant ore firms are already shipping ore from the mines to upper lake docks, these shipments being from properties from which it is the desire to get as large an output as possible during the season. The market continues inactive. We quote prices as follows: Old Range Bessemer, $5; Mesaba Bessemer, $4.75; Old Range non-Bessemer, $4.20; Mesaba non-Bessemer, $4.

**Pig Iron.**—The market shows some improvement in the volume of inquiries, but not many sales are reported. A local foundry that had an inquiry out last week for 2000 tons of foundry iron for the last half placed its contract with a local furnace on the basis of $16.50, delivered, for No. 2. Prices quoted on this inquiry ranged from $16.40 to $17.25 for No. 2. A local consumer is in the market for 500 tons of foundry iron for the last half, and several other inquiries are pending from northern Ohio foundries for lots ranging from 200 to 500 tons. No. 2 foundry is quoted at $16, Valley furnace, for the second quarter, and about $16.25 for the last half, but some producers are standing firm at $16.50 for the latter delivery. The sale of a small tonnage of resale Southern iron is reported at $12.50, Birmingham, for No. 2. One local interest reports the sale during the week of about 10,000 tons of foundry, basic and malleable iron for shipment to points outside of this district. For spot shipment and the second quarter we quote, delivered, Cleveland, as follows:

| | |
|---|---|
| Bessemer | $18.40 to $18.90 |
| Northern foundry, No. 1 | 17.00 to 17.25 |
| Northern foundry, No. 2 | 16.50 to 16.90 |
| Northern foundry, No. 3 | 16.00 to 16.50 |
| Gray forge | 16.15 to 16.40 |
| Southern foundry, No. 2 | 17.10 to 17.35 |
| Jackson Co. silvery, 8 per cent. silicon | 21.05 to 21.55 |

**Coke.**—There is some inquiry for foundry coke for the last half, but few sales are reported. The market generally is quiet and prices are weak. We quote standard Connellsville furnace coke at $2 to $2.25 per net ton, at oven, for spot shipment, and $2.25 to $2.30 for the last half. Connellsville 72-hour foundry coke is held at $2.50 to $2.75 for spot shipment, and $2.75 to $3 on contract.

**Finished Iron and Steel.**—Mill agencies report an improvement in inquiries for small lots of material and that specifications are holding up well. The demand for steel bars is still heavy. Agricultural implement makers are beginning to show anxiety to place contracts for their steel bar requirements for the year beginning July 1, but none of the mill agencies here has as yet opened its books for that business. Buyers are asking for a base price of 1.40c., Pittsburgh. They also want contracts for a full year, which some of the mills do not seem inclined to agree to. Steel bars are firm, the price of 1.50c., Pittsburgh, being shaded only for very desirable orders. Deliveries show no improvement. There is a fair demand for plates in small lots, on which some of the mills can make fairly prompt deliveries. Owing to the easing up of the plate situation, mills that have been getting premiums for quick delivery are now willing to take orders at about the regular price of 1.55c., Pittsburgh. There is a good demand for small lots of structural material, but new work requiring considerable tonnage is very slow in coming out. A fair volume of sheet business is reported; some of the mills have caught up on deliveries and can now make fairly good shipments. The price situation is also a little easier, some of the mills that have been asking a slight premium now taking contracts for delivery until October 1 at the current prices. Deliveries on blue annealed sheets, however, show no improvement. The demand for shafting continues good. With the opening of the building season the demand for twisted steel bars for concrete work has become quite active. The demand for iron bars is rather light and prices are not firm. We quote iron bars at 1.50c. to 1.55c., Cleveland. Warehouse business with jobbers continues heavy and mills are receiving large steel bar orders to replenish warehouse stocks.

**Old Material.**—The demand for scrap continues light. Local mills are still buying only in small lots and are holding back shipments of some grades on contracts. Some yard dealers are buying quite heavily, with the expectation of getting better prices soon. The market is fairly firm, but quotations are largely nominal. Prices per gross ton, f.o.b. Cleveland, are as follows:

| | |
|---|---|
| Old steel rails | $16.00 to $16.50 |
| Old iron rails | 17.50 to 18.00 |
| Steel car axles | 20.50 to 21.00 |
| Heavy melting steel | 15.00 to 15.25 |
| Old car wheels | 16.00 to 16.50 |
| Relaying rails, 50 lb. and over | 22.50 to 23.50 |
| Agricultural malleable | 14.00 to 14.50 |
| Railroad malleable | 16.00 to 16.50 |
| Light bundled sheet scrap | 10.50 to 11.00 |

The following prices are per net ton, f.o.b. Cleveland:

| | |
|---|---|
| Iron car axles | $21.50 to $22.00 |
| Cast borings | 8.25 to 8.50 |
| Iron and steel turnings and drillings | 9.00 to 9.50 |
| Steel axle turnings | 11.00 to 11.50 |
| No. 1 busheling | 13.00 to 13.50 |
| No. 1 railroad wrought | 15.00 to 15.50 |
| No. 1 cast | 14.00 to 14.50 |
| Stove plate | 12.00 to 12.50 |
| Bundled tin scrap | 11.00 to 11.50 |

## St. Louis.

ST. LOUIS, MO., March 28, 1910.

The volume of general business continues quite satisfactory. Building operations are in full swing, being facilitated by favorable weather conditions. The jobbing iron and steel trade is active and business in pig iron is improving. Coke is dull. The Vandalia Line has placed a contract for 1000 steel coal cars. The Terminal Railroad Association is contemplating the erection at East St. Louis of a new passenger depot costing approximately $200,000.

**Coke.**—No one seems inclined to buy coke in a large way, since the inquiries previously reported are still pending. Even the coal strike rumors have not awakened any interest among buyers, as the sections from which St. Louis draws its supplies are not affected. We continue our quotations for 72-hour standard Connellsville foundry $2.75 for any delivery to January, 1911, per net ton, f.o.b. oven.

**Pig Iron.**—There is a marked increase of interest in the pig iron market which is indicated by numerous inquiries, with several fairly good sized sales. Among the sales made were 2000 tons and 300 tons of malleable, 700 tons and 300 tons of high silicon, 1000 tons and 200 tons of high manganese, 300 tons and 200 tons of foundry. One house reports inquiries aggregating 3900 tons for all grades of Southern iron, including one for 2000 tons. There is also an inquiry out for 5000 tons of basic. As to prices, the market continues unsettled owing mainly to the continuance of offerings of resale iron, and on the part of some furnaces, an increased disposition to press sales. There is practically but one price, speaking broadly, for No. 2 Southern foundry for any and all deliveries prior to January 1, 1911, namely: $13, Birmingham, with doubtless opportunities for buying speculative certificates covering this grade for prompt shipment, in limited lots, at $12.50. Southern Ohio foundry is held at $16 to $16.50, at furnace.

**Lead, Spelter, Etc.**—Lead is quiet at 4.25c. to 4.30c. Spelter is somewhat firmer and held at 5.45c., East St. Louis. Zinc ore is in better demand and quoted at $42 to $43 per ton, Joplin, base. Tin has advanced ⅝c. per 100 lb.; antimony unchanged; copper steady. The demand for finished metals continues satisfactory.

**Old Material.**—Buyers and sellers are apart in their views, as indicated by the turning down of the offer of a large local consumer for 10,000 tons steel scrap. There are some transactions going on among dealers with a quite general expectation that resumption of business with consumers is close at hand; in fact, some orders are already coming in from outside territory. There is but one offering by railroads, that of 200 tons by the Vandalia. Relaying rails are virtually out of the market and quotations are nominal. With the exception of a few items, quotations remain unchanged; but the market is somewhat firmer for steel scrap, owing to more inquiry than for iron. We quote dealers' prices, per gross ton, f.o.b. St. Louis, as follows:

| | |
|---|---|
| Old iron rails | $15.50 to $16.00 |
| Old steel rails, rerolling | 15.50 to 16.00 |
| Old steel rails, less than 3 ft. | 13.50 to 14.00 |
| Relaying rails, standard sections, subject to inspection | 26.00 to 26.50 |
| Old car wheels | 15.50 to 16.00 |
| Heavy melting steel scrap | 13.50 to 14.00 |
| Frogs, switches and guards, cut apart | 13.50 to 14.00 |

The following quotations are per net ton:

| | |
|---|---|
| Iron fish plates | $14.00 to $14.50 |
| Iron car axles | 21.00 to 21.50 |
| Steel car axles | 19.50 to 20.00 |
| No. 1 railroad wrought | 14.00 to 14.50 |
| No. 2 railroad wrought | 13.00 to 13.50 |
| Railway springs | 12.50 to 13.00 |
| Locomotive tires, smooth | 16.50 to 17.00 |
| No. 1 dealers' forge | 11.00 to 11.50 |
| Mixed borings | 7.00 to 7.50 |
| No. 1 busheling | 12.00 to 12.50 |
| No. 1 boilers, cut to sheets and rings | 10.50 to 11.00 |
| No. 1 cast scrap | 13.00 to 13.50 |
| Stove plate and light cast scrap | 9.50 to 10.00 |
| Railroad malleable | 12.00 to 12.50 |
| Agricultural malleable | 10.50 to 11.00 |
| Pipes and flues | 10.50 to 11.00 |
| Railroad sheet and tank scrap | 9.00 to 9.50 |
| Railroad grate bars | 10.50 to 11.00 |
| Machine shop turnings | 10.50 to 11.00 |

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The Anheuser-Busch Brewing Association is about to erect a $350,000 addition to its ice plant, consisting of a freezing and ice storage house, 119 x 166 ft., three stories, to be equipped with the latest and most approved appliances.

John H. Gestring has purchased the John Rohan & Sons' boiler works. The building is considered one of the best and

strongest of the factory structures of St. Louis. The price paid was $65,000.

## Birmingham.

BIRMINGHAM, ALA., March 28, 1910.

**Pig Iron.**—Unsettled conditions still obtain in the pig iron market. Inquiries are scattering, and in some cases buyers are submitting prices at which they would be willing to take on round lots. This, of course, is more or less for the purpose of sounding the market and getting a line on the general feeling of sellers. Buyers have come to the conclusion that there is unrest manifested by producers, and this fact has a more depressing effect on the market than even the existence of seemingly prohibitive prices. Once this feeling dispelled and a firm stand taken by producers—showing that rock bottom prices have been reached—the buyer will be satisfied and can well afford to place his business and intelligently and satisfactorily figure on the placing of his products for future delivery. Sales the past week have been nominal and at prices ranging from $13 to $13.50, at furnace, for No. 2. Some of the producing interests here are holding firm at $13 for prompt shipment and over the second quarter and at $13.50 for last half delivery. Others seem willing to go through the entire year on the basis of $13, at furnace. The report that the leading pipe company is feeling the market for a good round lot has excited some interest, and with the placing of this business a healthier tone to the market is looked for. Southern charcoal iron is quoted at $22 to $22.50, at furnace.

**Cast Iron Pipe.**—Local cast iron pipe producers report that there is a pretty active demand for their product, now that spring is opening up. It is understood that Los Angeles, Cal., is in the market for 2500 to 3000 tons and that the order will be placed this week. The Portland Gas Company, Portland, Ore., has contracted for something like 3500 tons. No change in prices is reported and we quote water pipe as follows, per net ton, f.o.b. cars here: 4 to 6 in., $25; 8 to 12 in., $24; over 12-in., average, $23, with $1 per ton extra for gas pipe.

**Old Material.**—Dealers in scrap are more or less inclined to gather and stock material under present conditions. No active demand has been reported in this market for some time, though scattering sales continue to be made. The weather has been ideal for the gathering of scrap. We quote the following prices, per gross ton, f.o.b. cars here:

| | |
|---|---|
| Old iron axles | $19.00 to $19.50 |
| Old iron rails | 15.00 to 15.50 |
| Old steel axles | 18.00 to 18.50 |
| No. 1 railroad wrought | 13.50 to 14.00 |
| No. 2 railroad wrought | 11.00 to 11.50 |
| No. 1 country wrought | 10.50 to 11.00 |
| No. 2 country wrought | 10.50 to 11.00 |
| No. 1 machinery | 12.00 to 12.50 |
| No. 1 steel | 11.25 to 11.75 |
| Tram car wheels | 11.50 to 12.00 |
| Standard car wheels | 13.50 to 14.00 |
| Light cast and stove plate | 9.50 to 10.00 |

Ground was broken the past week on the plant of the Birmingham Horse Shoe & Rolling Mills Company, located at Gordon Heights, near Birmingham, Ala. This plant will turn out horseshoes and bar iron.

The red ore mine of the Sloss-Sheffield Steel & Iron Company near Bessemer, Ala., which has been flooded for some time, is fast being reclaimed, according to the statement of one of the officials of the company. Last week the timbering in an adjoining mine of the Woodward Iron Company caught fire. There was no loss of life and repairs are being rapidly pushed forward.

## Buffalo.

BUFFALO, N. Y., March 29, 1910.

**Pig Iron.**—There has been less booking of orders for the past week than for the week previous, owing principally to the fact that furnacemen have been inclined to be a little less strenuous in their efforts to secure new business by price concessions. This lessening of effort to sell is attributable to some extent to the desire by furnacemen to await the result of the miners' conference soon to be held, which will have an important bearing on the future production in this district. The situation in respect to costs is also further complicated by uncertainty as to the outcome of the action taken by the Buffalo district furnaces against the railroads that have issued notice of an increased freight rate on coke from the Connellsville fields to Buffalo, effective April 1. The furnace companies that brought the action have filed bonds to indemnify the railroad companies in case the decision should be adverse to the contention of the complainants. Notwithstanding this pause in the seeking of business by producers, inquiries are coming in freely and a good volume of moderate sized orders is being booked, both for foundry grades and malleable. Shipments on contracts are going forward to the full capacity of furnaces. In basic the demand has been limited and prices are not as well sustained. We quote as follows for current and forward delivery, per gross ton, f.o.b. Buffalo, although in some instances these prices have been shaded 25c. per ton for attractive business:

| | |
|---|---|
| No. 1 X foundry | $17.25 to $17.75 |
| No. 2 X foundry | 17.00 to 17.25 |
| No. 2 plain | 16.75 to 17.00 |
| No. 3 foundry | 16.50 to 16.75 |
| Gray forge | 16.25 to 16.50 |
| Malleable | 17.00 to 17.50 |
| Bessemer | 19.00 to 19.50 |
| Basic | 17.00 to 17.50 |
| Charcoal | 20.00 to 20.50 |

**Finished Iron and Steel.**—In bar material the demand continues to improve and prices are stronger, 1.50c., Pittsburgh, being the minimum, except for specially large and desirable tonnages. Specifications are coming along in heavy volume and the delivery situation at the mills is growing more tense. Plates and shapes are also showing considerably more strength, with prices 1.55c. to 1.60c., Pittsburgh, according to the desirability of the order. Business in cold drawn steel continues large and the inquiry for forging blooms is good. In structural material, while no large jobs have come up for bids during the week, and no contracts of importance have been placed locally, a good deal of small work has developed and all the Buffalo fabricators report much business in sight, with indications of a very active summer.

**Old Material.**—The week has shown but little change in the market, business being more or less spasmodic, but there appears to be an increasing disposition on the part of consumers to look around for material, and dealers report inquiries are becoming more frequent, with indications pointing to greater activity in buying in the near future. We quote as follows per gross ton, f.o.b. Buffalo:

| | |
|---|---|
| Heavy melting steel | $15.50 to $16.00 |
| Low phosphorus steel | 19.50 to 20.00 |
| No. 1 railroad wrought | 16.50 to 17.00 |
| No. 1 railroad and machinery cast scrap | 15.50 to 16.00 |
| Old steel axles | 20.00 to 20.75 |
| Old iron axles | 24.00 to 24.50 |
| Old car wheels | 16.00 to 16.50 |
| Railroad malleable | 16.50 to 17.00 |
| Boiler plate | 13.00 to 13.50 |
| Locomotive grate bars | 12.00 to 12.50 |
| Pipe | 12.50 to 13.00 |
| Wrought iron and soft steel turnings | 9.00 to 9.50 |
| Clean cast borings | 8.00 to 8.50 |
| No. 1 busheling scrap | 13.50 to 14.00 |

## The German Iron Market.

BERLIN, March 18, 1910.

The quieter tone of the market previously reported has continued, although the situation has, upon the whole, barely changed. It is evident that the strong forward movement of several months ago has come to a standstill, and this fact grows plainer from day to day. It is now reported that in some cases specifications on orders are coming in rather more slowly. It cannot be said, however, that the general situation has weakened. Neither have prices fallen, except in the case of scrap, which had been unduly bulled by speculators last fall; hence it was but natural that a reaction should follow the excessive price driving of that time. Producers remain in a hopeful frame of mind, as they have not yet noted any particular effect on business of the reaction in the American market.

In the pig iron trade the quiet tendency previously mentioned has probably grown still more pronounced. Prices, however, remain firm. In the ore market the tendency of prices is strong, particularly for Swedish and Spanish ores. It is also expected that the newly reorganized ore syndicate of the Siegerland District will raise prices about 1 mark per ton next month, and it is further said that all the mines in that region will soon be running to their full capacity.

The opinion expressed in this correspondence two weeks ago that the prospects for organizing the pig iron trade on a national basis had been materially improved by the prolongation of the combination for the Silesian District and the joining of the Kraft Works already finds a verification. A movement has been started again in the western part of the country looking toward getting all the furnaces into one organization. A conference of several of the leading concerns has already been held. The East German Pig Iron Syndicate, which is the name taken by the Silesian organization in its new form, is holding back with sales for 1911, in order to give the western furnaces time to see whether they can get together. It is reported to-day that the syndicate has concluded an arrangement for a harmonious price policy with the new furnace company at Lubeck. This again further increases the prospects for a general understanding among the furnaces of the entire country.

Several days ago the Siegerland Iron Ore Association was finally reorganized for four years, beginning from July 1, but four concerns are not in it. It had been expected that the meeting which prolonged the combination would also raise the price of ores about 1 mark per ton, but no such action was taken. As the furnaces have ordered ores to supply their requirements for the rest of the year, almost no new orders are now reaching the Siegerland mines. The im-

ports of ores in February dropped to a surprisingly low level. Only 184,000 tons were imported, against 587,000 tons in February, 1909. The drop in the movement last month was probably in part due to the unusually large imports in January, which reached 628,000 tons, against 464,000 tons in January, 1909.

At a meeting of the heavy plate manufacturers last week a motion was made to raise prices by 2.50 marks on orders of less than 50 tons, but this was voted down on the ground that the mills are already sold up to nearly their full capacity for the June quarter. The works regard it as probable that they will be able to adopt higher prices for dates beyond June 30, and for this reason sales beyond that date were not declared open. It was stated at the meeting that the mills are well employed on both home and foreign orders and that specifications are coming in at a satisfactory pace.

The situation in the bar market continues very good. For bars of soft steel prices now range between 112 and 115 marks. The mills are well supplied with specifications. In the plate market the strongest demand is for the thinner qualities, the bottom price for which is now 135 marks; but some grades command as high as 145 marks. A number of members of the Black Plate Association have latterly withdrawn from the export market owing to the recent reduction in the export drawback. A quieter tendency is also mentioned for wire and wire rods.

In semifinished steel trade remains satisfactory. It appears that consumers, in ordering supplies for the second quarter after the recent price advance, mostly sent in larger orders than usual. Hence the quotas assigned to the various mills in the syndicate exceed the nominal allotments. The export trade in such products continues very active and foreign buyers are trying to place orders for dates byond July 1. The prices for export are as follows: 83 to 85 marks for ingots, 95 to 97 marks for billets and 97 to 100 marks for muck bars, all f.o.b. port of shipment. Home prices range 2 to 5 marks higher than these, with an additional 5 marks for open hearth steel. The market for structural shapes has become somewhat quieter since the syndicate decided not to advance prices. The foreign demand remains pretty good, prices ranging between 106 and 108 marks. The rail business remains unsatisfactory and even light. Export orders, however, are being placed in considerable amounts at 110 to 112 marks for heavy rails. In grooved rails business is good and gaining in volume, and this is also true of rails for mines.

The Association of German Machine Builders met here several days ago. Privy Commercial Councillor Lueg of Dusseldorf, in giving the leading address, said that the German machinery industry was not able to exist upon the home market alone, but must have a market abroad. He also claimed that the existing duties on machinery were not high enough, and that Germany should follow the example of other countries and put on higher duties. He gave much serious attention to the higher protective duties on machinery recently adopted, or about to be adopted, by foreign countries, which he thought would do much damage to the German machinery trade.

The Rheinische Stahlwerke of Duisburg and Meiderich has decided to establish an additional open hearth plant, consisting of eight furnaces, each of 30 tons capacity. The cost will be 7,000,000 marks.

The Prussian State railroads are asking for bids for 500 locomotives.

Some of the big mixed iron companies in the western part of the country are about to increase their capital stock. The Rombacher Hüttenwerke proposes to raise 5,000,000 marks and the Bochumer Verein 4,800,000 marks. It is also reported upon good authority that the Deutsch-Luxemburg Company will raise at least 10,000,000 marks new capital.

## New York.

NEW YORK, March 30, 1910.

**Pig Iron.**—New inquiries for iron for the second half of the year are few. The more important consumers who have bought some iron at what have been regarded as low prices are willing to stop at that for the present, while in a few cases inquiries for second half iron which seemed likely to result in early business are still hanging fire. A purchase of 1000 tons of No. 2 foundry iron has been made by a Brooklyn foundry; another 1000-ton transaction was closed in Connecticut, and a number of sales from 100 to 600 tons have been made. Deliveries are largely for this quarter, and in fewer cases for second half. The favorable rate from Buffalo to the seaboard by canal, which in mid-season reaches $1, makes furnaces in that district rather more formidable competitors with eastern Pennsylvania furnaces, as the season of navigation approaches. The enforcement of the advanced coke rates from Pennsylvania to Buffalo would count to that extent in favor of the Eastern producer. Virginia and Alabama irons have been sold in fair amounts to New York district and New England consumers in the past week, Virginia No. 2 being offered at considerably below $15 for No. 2 foundry, while Alabama iron at $12.50, Birmingham, can be delivered in the East at prices even below recent concessions by Northern furnaces. We quote Northern iron at tidewater, for second quarter, as follows: No. 1, $18.25 to $18.50; No. 2 X, $17.50 to $18; No. 2 plain, $17.50 to $17.75. Southern iron is quoted at $17.75 to $18 for No. 1 and at $17 to $17.50 for No. 2.

**Ferroalloys.**—There have been some sales of ferromanganese in this market amounting perhaps to 1000 tons in the past week. This has not resulted in any advance in price, and, if anything, ferromanganese is weaker. It can be had in New York at from $41 to $41.50. Ferrosilicon is cheaper and only very small sales are being made. Buyers show no disposition whatever to come into the market for the last half. Ferrosilicon is in very good supply and some holders are willing to take $61.

**Finished Iron and Steel.**—There is no strenuous activity in any line, but the total business done during the week was fair. March has shown improvement over previous months and will close the best month so far this year. Plates are quiet, as they always are when the boiler shops in the East are not very busy, as it is mainly upon the latter that the plate business in this section depends. Very little new work is in hand either with the Eastern shipbuilders or boiler makers, and just now also the repair work is rather light. Steel bar deliveries continue to be away behind, and those who must have steel bars promptly are compelled to pay a premium. The bar iron trade is still enjoying the advantage of this situation and is also doing well on its own account, with a fair volume of business from the railroads. In this line there is not a great deal of contracting for future requirements, but such as there is the specifications are coming in nicely for three months ahead. In spite of the better weather, building work has not set in very seriously as yet. A number of good contracts are still pending and a few moderate sized ones have been closed. Largest of these in this quarter was that of the New Jersey Zinc Company for 4000 tons for new buildings, 2500 tons of which went to the Jones & Laughlin Steel Company and 1500 tons to the Lackawanna Bridge Company. Levering & Garrigues have taken 400 tons for a loft building on West Twenty-second street; the Hinkle Iron Company has 1200 tons for a warehouse on Duane street, and two other loft buildings on West Twenty-fifth street, one of 600 and one of 400 tons, have been placed. All of the foregoing are in New York City. Among the important contracts to be closed outside of this city are 5800 tons for the Big Four shops at Indianapolis, which will probably go to the McClintic-Marshall Construction Company, and 1200 tons for the three naval hospitals, for which the Noel Construction Company is the general contractor—one at Norfolk, one at Portsmouth and one at Chelsea—which will probably go to the Bethlehem Steel Company. Bids are to go in about April 8 for the steel, about 8000 tons, for the Merchants' and Manufacturers' Exchange, to be erected at the Grand Central Terminal, New York. Bids are now being taken on 400 tons for the Sloan laboratory at Yale University, for which Charles C. Haight is the architect. No changes in prices are to be noted. Bar steel is quoted at 1.61c. to 1.71c., depending upon the quantity and the time wanted; bar iron, 1.65c. to 1.70c.; plates and structural materials, 1.66c. to 1.71c., the latter being the general quotation.

**Steel Rails.**—Rail business so far as Eastern roads are concerned is light. The Pennsylvania Steel Company has sold 4500 tons of high T rails to the Milwaukee Electric Railway. Of 17,000 tons closed by the Illinois Steel Company last week, 2500 tons was taken by the St. Joseph & Grand Island Railroad and 11,000 tons by another line. Foreign rail business was unusually heavy last week, various mills closing a total of 70,000 tons.

**Cast Iron Pipe.**—Inquiries are coming in freely from private water and gas companies and the business from these sources is steadily filling the order books of manufacturers. No public lettings of importance are announced in the Eastern section of the country, but while the market lacks spectacular features the volume of business now being booked is quite satisfactory and the prospects for enlarged trade are steadily growing better. Prices are maintained at $25.50 to $26 per net ton, tidewater, for carload lots of 6-in., and $25 for large lots.

**Old Material.**—The better feeling referred to last week has become more pronounced and dealers are quite confident that the worst of the depression has passed. For the first time in many months an important eastern Pennsylvania steel company, not included in the associated buying arrangement, has been freed from embargoes and is again taking in steel scrap, while some buying is being done by dealers who still have contracts to fill. A better movement is reported in rerolling rails, car axles and cast scrap, and some interest is being taken in such neglected old material as railroad wrought and old car wheels. Trolley car wheels have been in best demand. Quite a number of buyers of various classes of old material are submitting offers somewhat under the market, but it is expected that if it is found that bargains can no longer be secured these buyers will not delay much longer in covering requirements. Relaying rails are in de-

mand for shipment to Southern points. About 1000 tons of the Panama Canal scrap was sold at $13.05, on barge, in New York harbor, the bids covering a wide range, with $10.50 as bottom. On the remainder of this scrap the bids were rejected, as the highest was $12.05. A statement has been issued by the Isthmian Canal Commission that the agreement with the Rosenthal Investment Company has been terminated because of rejections by that company, and that until further notice scrap iron received from the Isthmus will be sold by the shipload on proposals issued by the New York office of the Commission. The following quotations are per gross ton, New York and vicinity:

| | |
|---|---|
| Rerolling rails | $15.00 to $15.50 |
| Old girder and T rails for melting | 14.25 to 14.75 |
| Heavy melting steel scrap | 14.25 to 14.75 |
| Relaying rails | 22.50 to 23.00 |
| Standard hammered iron car axles | 25.00 to 25.50 |
| Old steel car axles | 19.50 to 20.00 |
| No. 1 railroad wrought | 16.75 to 17.25 |
| Wrought iron track scrap | 14.50 to 15.00 |
| No. 1 yard wrought, long | 14.50 to 15.00 |
| No. 1 yard wrought, short | 14.00 to 14.50 |
| Light iron | 8.00 to 8.50 |
| Cast borings | 9.00 to 9.50 |
| Wrought turnings | 10.50 to 11.00 |
| Wrought pipe | 13.50 to 14.00 |
| Old car wheels | 14.50 to 15.00 |
| No. 1 heavy cast, broken up | 14.00 to 14.50 |
| Stove plate | 11.00 to 11.50 |
| Locomotive grate bars | 11.00 to 11.50 |
| Malleable cast | 15.50 to 16.00 |

## Metal Market.

NEW YORK, March 30, 1910.

### THE WEEK'S PRICES.

Cents per pound.

| | Copper. | | | Lead. | | Spelter. | |
|---|---|---|---|---|---|---|---|
| Mar. | Lake. | Electrolytic. | Tin. | New York. | St. Louis. | New York. | St. Louis. |
| 24 | 13.75 | 13.37½ | 32.65 | 4.42½ | 4.27½ | 5.70 | 5.55 |
| 25 | 13.75 | 13.37½ | 32.65 | 4.42½ | 4.27½ | 5.65 | 5.50 |
| 26 | 13.75 | 13.25 | .... | 4.40 | 4.25 | 5.65 | 5.50 |
| 28 | 13.75 | 13.25 | 32.60 | 4.40 | 4.25 | 5.65 | 5.50 |
| 29 | 13.75 | 13.25 | 32.75 to 33.00 | 4.40 | 4.25 | 5.65 | 5.50 |
| 30 | 13.75 | 13.25 | 33.25 | 4.40 | 4.25 | 5.65 | 5.50 |

The copper market is sagging and unsatisfactory. A bright outlook prevails as to pig tin, and good statistics are looked for. Lead has gone lower and spelter is quiet.

**Copper.**—Lake copper seems to hold its strength but electrolytic is very dull and sagging perceptibly. The surplus of copper still impels the producers to seek to dispose of their stocks and electrolytic is offered at lower prices. It is thought in some quarters that even a fair amount of buying would not induce prices to advance much. Lake is still quoted at 13.75c., but electrolytic can now be had at 13.25c. The exports of copper for March will prove to be very light, as up to date only 16,783 tons was sent abroad and it is estimated that the total will be fully 10,000 tons less than in February. The London market has declined 17s. 6d. since last Thursday, but to-day it was more steady than it has been and spot brought the same price as it did yesterday, which was £58. Futures sold for £59 2s 6d, and the sales were good, amounting to 900 tons of spot and 1000 tons of futures.

**Pig Tin.**—The Easter holidays are especially observed abroad, and consequently there was no European market on Friday or Monday. The London situation was reflected here and the American market was a waiting one until yesterday, when some rather good trading was done and the price went from 32.75c. to 33c. Most of this business, however, was between dealers, and the bulk of it was for April delivery. Some was for May and a small amount was sold for spot delivery. Sentiment in the pig tin market has changed and it is believed that the statistics, which will be out April 1, will be good as far as the sellers are concerned, despite the fact that there will be a Banca sale to-morrow. The statistics are expected to show heavy deliveries in March, amounting possibly close to 4000 tons. The shipments from the East during March were very small, and it is said in decidedly authoritative quarters that those who take an optimistic view of the situation will not be disappointed. There are also reports that the coolies are leaving the tin producing districts and going to the rubber fields, where there is plenty of work with good pay, and as it now appears there will be no coal strike in Wales, the tin plate mills there will continue to be large users of pig tin. All things considered, the outlook for tin in better than it has been for two months. The arrivals thus far this month have been 3725 tons, and there are 2765 tons afloat. In London to-day spot tin was sold at £150 15s. and futures at £152 15s. The sales amounted to 400 tons of spot and 500 tons of futures. This afternoon sales of pig tin were made in New York at 33.25c.

**Tin Plates.**—Labor agitation in the building trades is affecting the consumption of tin plates, but the mills are having all they can do to supply the demand, and many of them are still behind, as other industries are taking large quantities. Some of the independent mills, however, have been able to reduce the premiums they have been asking, and $3.84 for 100-lb. coke plates is the prevailing price. Foreign tin plates are becoming scarce and the mills there are behind. There has been a slight advance in the asking price for Swansea plates which are now 13s. 3d.

**Lead.**—Lead is stagnant and the price has again gone lower. The holders of lead who looked for an early spring buying movement because of the open weather have been greatly disappointed, and consumers still insist that they will not fill their wants until further reductions are made. In the meantime the production of lead goes on and stocks are accumulating. From a selling standpoint the outlook is bad. During the week lead fell from 4.42½c. to 4.40c., and the outside interests control the situation. The American Smelting & Refining Company is making but few sales, according to all reports.

**Spelter.**—High grades of spelter, known as brass mill special, are being asked for and fully ¼c. higher is taken for this grade. Prime Western spelter, however, is cheaper, but as there is no buying of any account the quotations are practically nominal. Spelter can be had in New York for 5.65c.

**Antimony.**—Foreign antimony is still going at 7.50c., with but few takers, and Hallett's is 8.25c. Cookson's remains at 8.50c.

**Aluminum.**—The Hydro-Electric Commission of Canada has bought 1,500,000 lb. of aluminum wire from the Aluminum Company of America. The wire is to be used in the construction of an electric power transmission system from the Canadian side of Niagara Falls to the city of Toronto. There has been good buying from other sources, but prices are unchanged, with ingots at 24c., rods and wire 31c. and sheets 33c.

## Iron and Industrial Stocks.

NEW YORK, March 30, 1910.

The stock market experienced a decided setback during the week, partly because of the lack of some specially favorable development and partly because of the collapse in some of the copper stocks. Ordinarily the latter would not have had much effect, but it came at a time when the market was especially susceptible to bearish operations. Some stocks receded sharply because of special conditions affecting the particular company. Westinghouse Electric & Mfg., for instance, declined heavily on Monday on account of reported friction between two of the principal officers. The range of prices on active iron and industrial stocks from Thursday of last week to Tuesday of this week was as follows:

| | | | |
|---|---|---|---|
| Allis-Chalm,. com.. | 9¼ - 11 | Railway Spr., com. | 41 - 43¼ |
| Allis-Chalm., pref.. | 36½ - 39¾ | Railway Spring, pref. | ...103 |
| Beth. Steel, com.. | 29½ - 30½ | Republic, com. | 37 - 38½ |
| Can, com. | 11⅞ - 11¾ | Republic, pref. | 99¼-100½ |
| Can, pref. | 74 - 75⅝ | Sloss, com. | 74 - 77½ |
| Car & Fdry, com.. | 62¾ - 64 | Pipe, com. | 22 - 22⅝ |
| Car & Fdry, pref. | ...117⅞ | U. S. Steel, com. | 81⅞ - 84⅛ |
| Steel Foundries... | 57½ - 59⅝ | U. S. Steel, pref. | ..119¼-120 |
| Colorado Fuel. | 37⅝ - 40 | Westinghouse El. | 62 - 69¼ |
| General Electric. | ..150 -153 | Am. Ship, com. | 74 - 75 |
| Gr. N. ore cert. | 63¾ - 67 | Chi. Pneu. Tool. | 44½ - 45 |
| Int. Harv., com. | 90 - 91 | Cambria Steel. | 47¾ - 48¾ |
| Int. Harv., pref. | ...121½ | Lake Sup. Corp. | 23 - 23½ |
| Int. Pump, com. | 42 - 46½ | Warwick | 11½ |
| Locomotive, com.. | 49¼ - 51¾ | Crucible St., com.. | 14 - 14¾ |
| Locomotive, pref. | ...113 | Crucible St., pref.. | 84⅝- 86 |
| Nat. En. & St.,com. | 21 - 21½ | Harb.-W. Ref., com. | 35 |
| Pressed St., com. | 41½ - 42½ | Harb.-W. Ref., pref. | 93 |
| Pressed Steel, pref. | ...102⅞ | | |

Last transactions up to 1 p.m. to-day are reported at the following prices: United States Steel common 82½, preferred 120⅛, bonds 104¾; Car & Foundry common 62¾, preferred 117⅞; Locomotive common 50⅛, preferred 113; Colorado Fuel 38⅝; Pressed Steel common 41⅛, preferred 102⅛; Railway Spring common 41; Republic common 37, preferred 100; Sloss-Sheffield common 76; Cast Iron Pipe common 22, preferred 76¼; Can common 11⅛, preferred 74⅛; Allis-Chalmers common 10¼, preferred 38½.

**Dividends.**—Manning, Maxwell & Moore have declared the usual quarterly dividend of 1½ per cent., payable March 31.

The American Locomotive Company has declared the regular quarterly dividend of 1¾ per cent. on the preferred stock, payable April 21.

The American Rolling Mill Company has declared the regular quarterly dividends of 1½ per cent. on the preferred and 3 per cent. on the common stock, both payable March 31.

M. M. Broad, formerly of the Ohio Iron & Metal Company, and L. J. Newman, formerly of the L. J. Newman Iron Company, Chicago, have formed the copartnership of M. M. Broad & Co., with offices in the First National Bank Building, Chicago, for the purpose of trading in iron and steel scrap. The new firm will be in touch with Eastern as well as Western markets.

## The Fire Tax.

The United States Government owns buildings that cost more than $300,000,000 and is spending $20,000,000 a year for new buildings. None of these buildings is insured against loss by fire. Insurance at the ordinary rate would cost more than $500,000 a year, and the Government avoids this great tax by constructing buildings that are securely fireproof.

Tests to determine the strength and fire resistance of building materials are now made by the United States Geological Survey, and although these tests are designed primarily to meet the needs of the Government as the largest consumer, their results are also available for general use. These results show that cheaper fireproof materials can be used and that the difference in cost between fireproof and inflammable buildings will soon become so small that it will cease to encourage flimsy construction. They indicate that three to six times the necessary amount of material is habitually used in structural work. They also show the necessity of better building codes in cities and especially of a better enforcement of the codes already enacted if the present enormous fire losses are to be diminished.

### Inquiry to Show Loss by Fire.

The contrast between the small losses by fire to Government buildings and the immense losses reported from the country as a whole led the Geological Survey to make an inquiry as to fire losses in the United States and as to their exact cost to the people. The results of this inquiry are presented in the Survey's *Bulletin* 418, just published. The report is entitled "The Fire Tax and Waste of Structural Materials in the United States," and was prepared by H. M. Wilson and J. L. Cochrane of the survey. The inquiry covered not only the value of the property destroyed by fire, but also the cost of maintaining fire departments, the amount of insurance premiums paid less the amounts returned, the cost of protective agencies, the additional cost of water supplies, and other elements of the fire loss.

The investigation disclosed the fact that the total cost of fires in the United States in 1907, excluding that of forest fires and the marine losses, but including excess cost of fire protection due to bad construction and excess premiums over insurance paid, amounted to over $456,485,000, a tax on the people exceeding the total value of the gold, silver, copper and petroleum produced in the United States in that year. The cost of building construction in 1907 in 49 leading cities of the United States reporting a total population of less than 18,000,000 amounted to $661,076,286, and the cost of building construction for the entire country in the same year is conservatively estimated at $1,000,000,000. Thus it will be seen that nearly one-half the value of all the new buildings constructed within one year is destroyed by fire. The annual fire cost is greater than the value of the real property and improvements in either Maine, West Virginia, North Carolina, North Dakota, South Dakota, Alabama, Louisiana or Montana. In addition to this waste of wealth and natural resources, 1449 persons were killed and 5654 were injured in fires in the United States in 1907.

### Fire Loss Eight Times That in Europe.

The direct loss by fires in this country is eight times as much per capita as in any country of Europe. The actual fire loss in the United States due to the destruction of buildings and their contents amounted to $215,084,709, a per capita loss of $2.51. The per capita loss in the cities of the six leading European countries amounted to but 33 cents. Comparisons of the total cost of fires, which includes the items already stated, show that if buildings in the United States were as nearly fireproof as those in Europe the annual fire cost would be $90,000,000 instead of $456,000,000.

The report states the method of gathering the statistics collected, makes an analysis of the fire loss in city and country and on frame and brick buildings, and contains tables showing the increased cost of fire protection due to faulty construction. The predominance of frame buildings is set down as the most important cause of the great fire waste in the United States. Defective construction and equipment constitute a second cause.

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The Lehigh Valley Structural Steel Company, Allentown, Pa., has taken a lease on the buildings formerly used as rail and beam mills and the ground adjacent thereto of the Allentown Rolling Mills. The company will make a specialty of fabricating Bethlehem columns and beams, but will also use standard sections. Most of the necessary machinery has been purchased, and it is expected that the new plant will be in operation early next month. The estimated capacity at the present time is about 1000 tons a month, which will be increased as requirements demand. F. S. Komp, formerly with the Modern Steel Structural Company, Waukesha, Wis., is manager of the new concern.

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The Pressed Steel Car Company has been granted an order by the United States Circuit Court, New York, suspending the injunction and order of accounting granted in the suit against it of the Simplex Railway Appliance Company. This order is granted pending the determination of an appeal taken by the Pressed Steel Car Company, and is on a provision that the company shall file a bond with the court in the sum of $20,000 to cover costs and damages which might accrue to the Simplex Railway Appliance Company in case the appeal goes against the Pressed Steel Car Company.

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The four open hearth furnaces recently added to open hearth department No. 4 of the Homestead Steel Works of the Carnegie Steel Company gives a total of 64 open hearth furnaces at Homestead, making it much the largest single open hearth plant in the world. All these furnaces are in operation, making 9000 tons or more of open hearth steel per day. The Bessemer plant at Homestead is also in operation; it has two 10-ton converters and is really an emergency plant, being operated only when the heavy demand for steel requires it, which is the case at present.

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At the recent convention in Pittsburgh of the National Association of Jobbers of Wrought Pipe and Fittings a census of the percentage of expense of distributing pipe, fittings, valves and kindred lines was taken. The average thus secured was 14 1-10 per cent. on the gross sales, or 16 2-3 per cent. on the cost. It was, therefore, decided that in order to clear 5 per cent. it would be necessary for jobbers to add 25 per cent. to their cost.

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Geo. H. Thacher & Co., Albany, N. Y., who have been in business since 1852, have recently incorporated with a capital stock of $400,000 to do a general casting business in gray iron, brass and grate bars, including the manufacture under the patents of C. T. Coe of the Coe sectional shaking grate and the Coe improved combustion and draft system. Extensive alterations and improvements of the plant are under way which will enable the company to double the present output.

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The Youngstown Sheet & Tube Company, Youngstown, Ohio, announces that April 1 it will begin making deliveries on coppered wire, in No. 12 gauge and coarser, furnished, unless otherwise ordered, in exact weight coils of 100 lb. Orders for the company's standard coated nails may now be taken from jobbers for shipment April 1. It is the intention to market this product exclusively through jobbers.

## British Court Against the Ilgner System for Rolling Mills.

Some details were given in our issue of March 3, 1910, page 519, of the patent infringement suit on trial in London early in February over the Ilgner system for the control of electrically driven reversible rolling mills. The Donnersmarckhuette Oberschlesische Eisen und Kohlenwerke A. G. had brought suit against the Electric Construction Company, Ltd., an English corporation, alleging infringement of the patent granted to Carl Ilgner. The decision in the case, given in substance in the *Iron and Coal Trades Review* of March 11, 1910, was against the validity of the patent.

In reviewing the evidence the court said that the defendant company had added a flywheel to the intermediate dynamo of the Ward-Leonard system; it had constructed the intermediate motor in such manner as to secure a reduction of speed with increase of load, and in that way supplied extra power from time to time required by the working motor, and to the extent of the power so supplied relieved the source of supply. The court held that there was no invention in carrying the idea of flywheel control into effect and that the combination did not really lead to any new results. He held further that the real reason why reversible rolling mills were never run electrically until after the granting of the Ilgner patent was that motors strong enough and electric plant large enough for the purpose had not been brought to the requisite state of perfection. As soon as electric plant had been so perfected the court considered that any competent electrical engineer would see without assistance from the Ilgner proposal that the only practical system of control in the electric driving of rolling mills was the Ward-Leonard system. It had been contended for the plaintiffs that it required invention to recognize that though the speed drop in the intermediate motor, which was necessary to enable the flywheel to act, would naturally reduce the speed of the working motor, this advantage could be counteracted by manipulating the fields of the dynamo through which the motor was controlled. The power of keeping the speed of the working motor constant by regulating the voltage at the brushes of the intermediate dynamo was a well-known advantage of the Ward-Leonard system, and he did not consider that any invention was required to see that the power could be exercised to counteract any falling off in speed of the working motor, however such falling off was caused. The conclusion he had come to was that the patent in question was invalid for want of subject matter.

## Ore Briquetting Plant at Duquesne.

The Carnegie Steel Company, Pittsburgh, has just closed a contract for the installation of an ore briquetting plant at the Duquesne Works, Duquesne, Pa., for briquetting blast furnace flue dust. The Gröndal process will be used, which is controlled in the United States by the American Gröndal-Kjellin Company, 45 Wall street, New York. The finished briquettes will be of standard size, about 4½ x 2½ x 9 in.. It is the intention to concentrate a portion of the blast furnace flue dust and briquettes made from the concentrates will be used in the open hearth furnaces at Duquesne instead of hard ores, while the briquettes made from the raw flue dust will be charged into the blast furnaces at Duquesne. The new plant will consist of four kilns, with a daily capacity of 100 tons each. Work will be started at once, and it is expected the plant will be in operation in six months. At the Duquesne Works are many thousands of tons of flue dust and large accumulations at the Carrie and Edgar Thomson Works, as well as at Mahoning and Shenango Valley furnaces will be shipped to Duquesne for briquetting.

The Gröndal process, which has already been described in *The Iron Age*, is in use in Sweden and in other European countries. No binder is employed, the briquetting being the result of pressure and the action of heat.

## Cement Manufacturers' Problems.

A recent number of the *Concrete Review* contains a progress report of the Committee on Technical Research of the Association of American Portland Cement Manufacturers. This committee has had the problems of the action of oil on concrete and the effect of varying temperatures on the hardening of concrete under consideration. With regard to the first, the report states that, so far as can be ascertained, lubricating oils have no destructive effect on well hardened concrete. The question of the percolation of oils through concrete is, in the committee's opinion, of vital importance, as, if concrete could be made impervious to oil, it would doubtless be widely used for the construction of storage tanks for petroleum and gasoline.

At the time of making the report the committee was not in a position to make any recommendations on the second problem, but it is planned to carry on a series of tests at laboratories situated near cold storage warehouses where the test pieces can be stored. The committee is also carrying on other investigations. One of these has for its object the finding of a method for determining the percentages of extremely fine dust in cement ground in mills of different kinds. A series of experiments by subsidence in benzine has been conducted, but no satisfactory results have been obtained, as the finest particles subside very rapidly. The committee has therefore come to the conclusion that no useful separation can be accomplished by this method.

The other topic under investigation was the cause of cement becoming quick setting on storage. The commonly accepted explanation of this action is that gypsum is effective in retarding the set when a small amount of free lime is present, as in the case of freshly ground cement. This trace of free lime is gradually converted into calcium carbonate by long exposure to the air and cannot therefore assist the gypsum. The addition of 1 or 2 per cent. of ordinary hydrated lime just before use is sufficient to make the cement again slow setting. Longer storage of cement allows the aluminate of lime which is the cause of the quick setting to become hydrated or carbonated and the cement therefore becomes in time again slow setting. The experiments of the committee have demonstrated the truth of this explanation.

## Labor Notes.

The strike of 200,000 coal miners in South Wales, which was thought inevitable owing to the breaking off of negotiations, has been prevented. By the intervention of the Board of Trade, according to a Cardiff cablegram, the mine owners made new proposals last week and the miners have practically accepted them.

Building trades unions in New York have decided that no general sympathetic strike be declared in support of the striking steam fitters who ask an increase from $5 to $5.50 a day. Twenty unions out of 38 decided to strike on individual buildings to be selected by the Enterprise Association of Steam Fitters. Of the remaining unions 11 were not heard from, 6 will wait to see what comes of the action of the others, and one, the Electrical Workers' Union, refused to strike.

The riveters employed at the plant of the Petroleum Iron Works Company, Sharon, Pa., have been granted an increase in wages.

The Youngstown Sheet & Tube Company, Youngstown, Ohio, through J. A. Campbell, president, has issued orders that absolutely no more work shall be done at the plants of this company on Sundays than is absolutely necessary.

# THE MACHINERY MARKETS.

The demand for small machine tools has fallen off throughout the country, and most of the business coming before the trade is in the shape of orders for single machines. Many of these, however, are for machines of such a large size that the expenditures for them would cover the cost of a fair number of small tools. The demand for machinery for the automobile trade has slackened, except in the West. In Detroit there is good buying from the automobile industries, and a notable machinery list, issued by the Transcontinental Railway of Canada, is before the Chicago trade. It is apparent that threatened labor troubles have affected the demand for such power equipment as is adaptable for use in office buildings and other large structures.

## New York.

NEW YORK, March 30, 1910.

The past week has been marked by a decided change in the character of the demand for machinery. In the machine tool trade some makers who may not have shared in the recent rush of general business are having their innings. A noticeable number of orders for special heavy machine tools, such as heavy planers, shapers, large grinders and boring mills, are being placed and they invariably come for single machines. These orders, however, are for such large machines that the single orders sometimes call for expenditures that would cover a modest list of small tools. In consequence some are complaining of a lack of orders, while others are decidedly complacent over the situation.

In the power line exactly reversed conditions exist. Not much is being asked for in the way of heavy power equipment, but engines from 25 to 75 hp. are ordered, while boilers of a corresponding size are selling well.

Some decidedly good business has been placed for conveying machinery. The New York Central Railroad has just ordered about $60,000 worth of coal conveying equipment to be used in New York City, while the Spencer-Kellogg Company is purchasing extensively in this line. This company recently placed with the H. W. Caldwell & Son Company, Chicago, Ill., an order for a large plant at Buffalo, N. Y., and the company is now taking bids, it is understood, on about $9000 worth of equipment for coal handling at its Edgewater, N. J., plant.

The railroads continue practically out of the market. The New York Central is holding off a large list it is known to have prepared, and the Pennsylvania Railroad, which was expected to buy, has not come forward with any business. The Ingersoll-Rand Company has not as yet asked for bids on the machinery it will require for improvements at its Philipsburg, N. J., plant, mentioned last week.

The American Locomotive Company continues to be a good buyer of machine tools and a number of orders have been reported in this market within the last two weeks.

### Joint Meeting of Manufacturers and Dealers.

The American Supply and Machinery Manufacturers' Association and the National Supply and Machinery Dealers' Association will hold their next annual joint convention at Atlantic City, N. J., on May 11, 12 and 13. The headquarters hotel has not been selected as yet, but the executive committees of the two associations will make their decision on that matter within the next few days. The membership of the National Supply and Machinery Dealers' Association has doubled within the last six months, so an especially large convention is looked for.

The Senn Mfg. Company, which was organized with $50,000 capital to manufacture agricultural implements at Montgomery, Ala., is preparing for the construction of a new plant. The company was formed by Edward E. Wegelin and has a plant now at Egg Harbor, N. J., which will be moved to Montgomery at soon as its new plant is completed. The Egg Harbor factory has already been dismantled and the machinery prepared for shipment. The company manufactures steel hoes and shovels especially, together with tools and handles. It will later on require additional equipment for its proposed plant.

The Only Car Company, 1919 Broadway, New York, with works at Port Jefferson, N. Y., has nearly completed a factory for the manufacture of motor cars, motor boats and aeroplanes. During the first year of its manufacturing the company will have its parts all made in outside shops and will only assemble its machines. It intends eventually to manufacture its own parts, however, and later on will come forward with machinery requirements for that purpose.

The Pearce Brothers Mfg. Company, Newark, N. J., leather tanner, which manufactures special automobile and belt leathers, has purchased a tract of land 300 x 800 ft. on Frelinghuysen avenue, Newark, on which is to be erected a two-story building, 100 x 300 ft., and a one-story structure, 70 x 100 ft. The plant will be built as soon as possible. The company is also planning other buildings to be erected later on. The amount of power equipment to be installed is not known, but the requirements will probably include a fair sized power plant, together with power accessories, transmission machinery and special leather finishing machinery.

The Rome Mfg. Company, Rome, N. Y., has not as yet decided on the machinery it is to install in a new plant which is to be 60 x 300 ft., two stories. The company manufactures copper and brass goods and the machinery details are now under consideration.

Levering Brothers, Baltimore, Md., has awarded a contract to the Chesapeake Iron Works, Baltimore, for a building 75 x 90 ft., which is to be of steel construction. In this structure will be installed a 96-in. cupola, a 50-hp. boiler, a 35-hp. engine and a suitable blower.

The Rochester Structural Steel Company, Rochester, N. Y., has erected a small building for the manufacture of structural steel. The company states that later, if it increases its capital, additional machinery may be required.

The O. M. Edwards Company, Syracuse, N. Y., expects in the near future to go extensively into the manufacture of iron and steel valves. The company is now adding to its business the manufacture of gates, globes, angles, checks and radiator valves.

The Department of Health of the city of New York, whose offices are at the southwest corner of Fifty-fifth street and Sixth avenue, has specifications out for a small power plant for a tuberculosis sanitorium at Otisville, N. Y. The installation will include a 50 kva. generator.

Since the fire which occurred in the plant of Kreuter & Co., Eighteenth avenue, Newark, N. J., five months ago, the company has completely rebuilt its shops of concrete construction and has installed modern equipment for the manufacture of drop forges, &c.

John C. Blevney of Newark, N. J., has sold type F machines for polishing round bed tubing to the Newark Spring Mattress Company and the Greenpoint Metallic Bed Company.

A large crushing plant for ballast, with heavy gyratory breaker, elevator, conveyors, screens, &c., will be installed this year by the Public Service Railway Company, Newark, N. J.

A mechanical filtration plant of considerable capacity may be constructed during the summer at Geneva, N. Y. Preparation of plans has been entrusted to a water works specialist.

A boiler of 125 to 150 hp. will be required this spring for the municipal power station at Catskill, N. Y.

The F. N. Burt Company, Buffalo, N. Y., has purchased ground upon which a new factory will be erected later on. Definite plans for building have not yet been made. Some additional operating machinery may be provided in the near future for the present plant.

An addition to the plant of the Elmira Foundry Company, Elmira, N. Y., recently started, will enlarge its available floor space by about 15,000 sq. ft.

The Automatic Coin Wrapping Machine Company, recently incorporated at North Tonawanda, N. Y., will establish a plant for the manufacture of apparatus for handling specie. A site is reported to have been chosen near the new shops of the American District Steam Company.

In connection with the brass foundry building to be erected by M. L. Oberdorfer at Syracuse, N. Y., additional power machinery will be needed.

W. L. Stoddart, an architect of New York City, is reported to be taking bids on the power plant for a large new building at Savannah, Ga.

Some machine tools and other equipment will probably be required by Brokaw Brothers, Plainfield, N. J., for rebuilding its large garage and repair shop which was destroyed by fire March 26.

The boiler room in the five-story brick building occupied by E. R. Squibb & Sons, manufacturing chemists, Brooklyn, N. Y., was destroyed by fire March 27. Plans for rebuilding are not yet under way.

## New England.

BOSTON, MASS., March 29, 1910.

Conditions in New England are very satisfactory as far as they affect the machine tool industry. A better spirit pervades the market. One evidence of this is an increased demand for planers, which had been going a little slowly. The auction sale last week of the large machine tool equipment of the Corwin Mfg. Company, Peabody, Mass., formerly the Vaughan Machine Company, proved that prices paid at recent sales were not fictitious, the same eagerness to purchase being exhibited. Some tools brought almost new prices, and even the older machinery, of which there was a large amount, brought reasonably good figures. A total of about $80,000 was realized. Buyers came from distant points to get the benefit of the immediate deliveries which purchases included.

The power plant of the Light, Heat & Power Corporation at North Adams, Mass., will be enlarged by the addition of a condensing steam turbine of 1500 hp. capacity, direct coupled to a 1000 kw. alternating current generator. Contracts covering the main equipment have already been signed, but considerable auxiliary apparatus will be purchased as needed.

The boiler builders of this territory are working at maximum capacity, in some cases with night shifts. A large proportion of this business is for replacements and for miscellaneous work, such as tanks. The engine builders are naturally not proportionately active, though some of them are really busy, and in no instance can the orders on the books be pronounced small.

The Locomobile Company of America, Bridgeport, Conn., will erect a new manufacturing building, 54 x 150 ft., four stories, and a one-story blacksmith shop 50 x 150 ft.

The Brown & Sharpe Mfg. Company, Providence, R. I., manufacturer of machinery and machinists' tools, will erect a five-story addition to its No. 5 building. The structure will have a frontage of 80 ft. on Holden street and 145 ft. on Woodland street. It will be of heavy steel construction, with concrete floors and waterstruck brick walls.

The Ellery Twist Drill Company, Portsmouth, N. H., will take over the ground floor of the building recently used as a machine shop by the Portsmouth Forge Company, which will increase the floor space devoted to the business by over 20,000 sq. ft.

A dispatch from Pittsfield, Mass., states that the General Electric Company proposes to spend $500,000 this season in additions to the manufacturing facilities of its works in that city. Additions already announced include a punch and press building, 120 x 375 ft.; an office, storage and manufacturing building 80 x 600 ft., four stories; annealing building, 80 x 120 ft., pattern storage building, 80 x 160 ft., and a power house which will double the present power capacity.

The Draper Company, Hopedale, Mass., manufacturer of textile machinery, will erect a steel structure as an addition to a new storage building, which will be devoted to the setting up department, and a new office building.

The Walker & Pratt Mfg. Company, Boston, Mass., manufacturer of ranges, will extend the molding floor of its foundry at the plant in the suburb of Watertown, and will make additions to equipment, so that the total increase in productive capacity will be about one-third.

The T. F. McGann Sons Company, 104 Portland street, Boston, will build a new brass foundry in Somerville. The structure will be 50 x 150 ft.

The E. J. Manville Machine Company, Waterbury, Conn., manufacturer of herders, thread rolling and special machinery, has increased its capital stock from $25,000 to $100,000. The new capital does not carry with it plans for increase in the plant.

The Simonds Mfg. Company has added to its Fitchburg, Mass., plant by the purchase of a factory once used by the Rolling Machine Company. It adjoins the present plan of the Simonds Company and adds about 25,000 sq. ft. of space most conveniently located. The substantial brick building now on the ground will be remodeled and fitted throughout with complete equipment for the manufacture of all kinds of saw handles and wood saw frames. The woodworking departments of the Simonds Mfg. Company, which have heretofore been located at different places, will be brought together in the new factory. The wood saw business of the Simonds Company has grown to such an extent that it demands more room to take care of further increases which trade indications now promise.

The Seymour Metal Goods Company, Seymour, Conn., will establish a factory for the manufacture of german silver and brass novelties.

The John M. Dean Pin Company, Lowell, Mass., will establish a factory at Putnam, Conn., for the manufacture of pins, including the points used on a talking machine.

The Underwood Typewriter Company, Hartford, Conn., will make large additions to its manufacturing capacity this season. One building will be 50 x 444 ft., five stories; another 100 x 179 ft., one story, while a four-story building 45 x 355 ft. will be raised a story.

The Connecticut Company, Bridgeport, Conn., operating an extensive street railroad system in southern Connecticut, will increase its power plant at Bridgeport, adding the equivalent of one-third of the present capacity, bringing the horse power up to 5000.

Additions to general manufacturing plants include the following: Laconia Car Company, Laconia, N. H., 200-ft. addition to paint shop; National Biscuit Company, Newark, N. J., factory at Hartford, Conn., 60 x 175 ft., one story; Quisset Mill, New Bedford, Mass., new cotton mill plant, to be equipped with 80,000 spindles; Keith Shoe Company, Brockton, Mass., shoe factory, 45 x 304 ft., four stories, with two-story ell 40 x 56 ft., and a shipping room; New Britain Carriage Company, New Britain, Conn., factory 50 x 90 ft., three stories; Heywood Boot & Shoe Company, Worcester, Mass., shoe shop, 25 x 40 ft., five stories; T. Martin & Bro., Lowell, Mass., webbing, addition to employ 250 persons; Thames River Specialties Company, Montville, Conn., paper manufacturer, new plant in that village, Willis A. Briscoe, Norwich, Conn., secretary.

## Philadelphia

PHILADELPHIA, PA., March 29, 1910.

Machine tool merchants continue to report quiet conditions. In some instances the volume of business transacted during the week shows a decline, in others a few sales of fair size have brought the total up to a comparatively good basis. New business has developed rather sparingly and inquiries received are usually unimportant, although it is said that several automobile manufacturers in this territory are preparing to enter the market for additional equipment. The railroads in this vicinity have been light buyers, and it is understood that while requisitions for additional tool equipment have been prepared by the various master mechanics, none of particular interest to the trade has yet been sent out for estimate. Manufacturers are in a somewhat better position than merchants, recent bookings having filled up order books pretty comfortably, and makers are now confronted with the question of giving satisfactory deliveries. In some cases they are materially handicapped by the inability to obtain good deliveries on steel castings, the majority of the steel foundries in this territory being already much behind on shipments. Gray iron castings can still be had with reasonable promptness, this branch of the trade not being so well filled up with orders as the steel castings branch. Special tool makers report a very good run of business; manufacturers of cold saw cutting-off machines particularly have booked extensive orders during the past month. Builders of machinery and machine tools in nearby locations, particularly Chester, Pa., and Wilmington, Del., state that a fair amount of current business is being received, but no urgent demand.

The second-hand machinery and power equipment market continues rather dull.

The labor situation, which has had an unfavorable influence on the trade for several weeks, is now very much simplified. The sympathetic strike was called off March 28; it never assumed the proportions of a general strike, and many who had walked out returned to their work long before the strike was officially declared off. A number of the striking conductors and motormen, employees of the Philadelphia Traction Company, are still out, but this has practically no effect on the machinery trade.

The Chambers Brothers Company is taking estimates on a three-story brick and steel addition to its machine shop. The new building, 65 x 80 ft., will be erected on Media street, above Fifty-second street. It will be used largely for an erecting shop, no additional tools being required for its equipment. An electric traveling crane of 8 to 10 tons capacity will be installed.

The Hulton Dyeing & Finishing Company, Inc., is having plans prepared for a four-story addition, 100 x 125 ft., to its plant at D and Ontario streets, particulars regarding which are not available.

The Keystone Steel Casting Company, Chester, Pa., is making improvements to its plant, building additional crucible melting furnaces, &c., by which its present melting capacity will be doubled.

Theodore W. Pietsch, American Building, Baltimore, Md., is understood to have completed plans for a one-story fireproof ice making plant for the Pokomoke City Electric & Ice Mfg. Company, Pokomoke City, Md.

The Commissioners of Schuylkill County, at Pottsville, Pa., have invited architects to submit separate plans for an insane asylum and sewage disposal plant to be erected at Schuylkill Haven, Pa. The buildings are to be absolutely fireproof. Preliminary plans will be received until April 26.

The Shamokin & Coal Township, Light, Heat & Power Company, Shamokin, Pa., has, it is stated, been taken over

by New York interests, who will erect a new addition to the gas plant.

The death of Alfred Box of Alfred Box & Co., crane and hoist builders of this city, will result in no change in the conduct of the business, which will be continued as heretofore.

Levering Brothers, Baltimore, Md., will erect a new foundry for the manufacture of sash weights, at Monroe and Wicomico streets, in that city. Plans for the buildings are now being prepared.

The Pomeroy Construction Company has the contract for a water cooling plant to be built for the Electric Storage Battery Company, Nineteenth street and Allegheny avenue. The necessary equipment has already been purchased.

The Quaker City Chocolate & Confection Company, Germantown and Susquehanna avenues, is taking estimates on a four-story addition, 43 x 134 ft., to its factory. This company will be in the market for two new boilers, a direct connected dynamo and engine, two 7500-gallon pressure tanks, elevators, &c., for equipping the new addition.

The Board of Water Commissioners, Reading, Pa., has awarded contracts, against proposals recently referred to in these columns, for cast iron pipe and specials, to the Standard Cast Iron Pipe & Foundry Company, Bristol, Pa.; cast iron gate boxes to the Reading Scale & Machine Works, Reading, Pa., and the building of a high pressure pumping station to Fehr & O'Rourke of the same city, these being the low bidders in their respective classes.

A pattern shop 40 x 130 ft., foundry and machine department 100 x 500 ft. and two other buildings used for general purposes will be added to the plant of the T. B. Wood's Sons Company, Chambersburg, Pa.

The power plant which the Alpha Portland Cement Company, Easton, Pa., is building in connection with its new Alsens mills will contain three single tandem gas engines, each with 24-in. cylinders and 36-in. stroke, direct connected to three alternating current generators of 500 kw. capacity; also a vertical gas engine, driving an air compressor. Producers will furnish the necessary gas. The works are to be motor driven in all departments, so that a heavy line of electrical equipment is required. The contract for the generating units has already been closed.

The Chambersburg Engineering Company, Chambersburg, Pa., has found its facilities severely taxed this season by the demand for steam forge hammers.

Work is to be commenced in the near future on the pumping station and complete system of water supply proposed for the city of Greencastle, Pa. Machinery has not yet been purchased.

The plants of the O. F. Zurn Oil Company, manufacturer of lubricating oils; Haney-White Company, manufacturer of doors, sashes, blinds and mill supplies, and Ternan & White, planing mill and lumber yard, adjoining at Broad street and Lehigh avenue, were practically destroyed by fire on March 26. The aggregate loss is estimated at $600,000.

Pulverizers for the new plant of the Clinchfield Portland Cement Company of Nazareth, Pa., located near Knoxville, Tenn., will be furnished by the Lehigh Car, Wheel & Axle Works, Catasauqua, Pa.

The Krupp Foundry Company has been organized at Lansdale, Pa., with capital stock of $100,000.

The Metropolitan Electric Company, Reading, Pa., is adding largely to its line of transformers for lighting service.

The construction of a power and pumping plant for municipal service is under consideration at Elkton, Md.

The superintendent of the Mint, Philadelphia, will receive bids until April 18 for general supplies required for all institutions in mint service for the fiscal year commencing July 1. The various schedules and specifications can be had upon application to the superintendent.

## Pittsburgh.

PITTSBURGH, PA., March 29, 1910.

With the advent of spring, erection work on new plants and extensions are being started at numerous points in the territory naturally tributary to this market, and work which was either held up or else carried on very slowly during the winter months is now being rushed to completion. For most of these new enterprises, orders covering machinery have already been let wholly or in part, with a view to obtaining assurance of the equipment when needed; and buyers are now beginning to betray considerable anxiety as to whether or not they are going to get the necessary tools for shop operation by or before the delivery dates specified. A few weeks ago there was every likelihood that many of them would not; but the decline in actual bookings recently noted is enabling shops in all parts of this district to catch up on orders, and in practically all cases manufacturers are straining every resource to fulfill to the letter the promises of delivery made some weeks or months ago.

The larger plants, however, are still 8 to 10 weeks behind on orders, with about the same condition existing in all departments, and if the present run of small contracts continues for some time to come, it will be welcomed in preference to the larger business which seems to be held up in various quarters. The latter is not needed now and may be very welcome later on, when the usual summer dullness would ordinarily set in.

Builders of cranes, traveling bridges, hoists, elevators, conveyors and other apparatus for handling heavy or bulk material are among the most crowded with work of any machinery builders; and orders that are not considered worthy of special effort, for the purpose of holding desirable future trade, have recently been allowed to go begging. The result is to encourage some of the smaller manufacturers in this and other sections of the country to extend their facilities to the utmost, in order to secure for themselves as much of this business as possible, but the large crane companies are not at all worried over that circumstance, as the needs of users are expanding much more rapidly than provision can be made to meet the demand. Replacements alone within the next few years, due to the heavier loads now handled in plants of every description, will be almost, if not quite, sufficient to take care of the present crane-building capacity of the country. This is a situation which, before a great while, will call for serious consideration.

Members of the metals trades here are taking great interest in the preparations at Detroit for holding the annual convention of the American Foundrymen's Association, June 6 to 10. Next year's convention will probably be held in this city, which is the logical place for it, and Pittsburgh also expects to have the next president of the association, so the local members are now busy getting pointers on how to handle such a gathering to the best possible advantage.

Plans have recently been completed by the Coshocton Light & Heating Company, Coshocton, Ohio, for the building of a hydroelectric plant of about 500 hp. initial capacity.

Dealers here are reported to have been figuring lately on machine tools and other equipment for the Avery Company, which is about to erect a new plant at Peoria, Ill., for the manufacture of agricultural implements.

The city of Corry, Pa., will arrange this spring for the installation of two vertical compound pumping engines for high duty, to displace horizontal units of the direct acting type now in service. It is not understood that any contract for the purchase of the engines has thus far been let; 2,000,000 to 3,000,000 gal. capacity is required.

Some equipment will probably be needed later in the year for development work on ore property reported to have been recently acquired from the Wright Iron Company, Toledo, Ohio, by the Cambria Steel Company, Johnstown, Pa. This adjoins the latter's Republic mine, situated near the end of the Marquette range in upper Michigan, and it has been partially opened up by a single shaft extending down 800 ft.

The Woodsdale Motor Car Company, Woodsdale, W. Va., has installed a repair shop in connection with its public garage.

Pittsburgh interests, including E. H. Stoner, R. H. Erving and W. H. Donner, control the Southern States Lumber Company, recently organized here, which will probably be in the market for considerable machinery, as its plans are reported to include the erection of sawmills at various points in the South.

Stone working machinery and some additional power and pneumatic equipment will be required for an extension of the Fred A. Long Marble & Granite Company's works at Parkersburg, W. Va.

The United States Engineering & Foundry Company, Pittsburgh, contemplates a number of changes in its plants at Youngstown, Ohio. The entire foundry department is to be moved to the Oak street plant to provide additional room for the machine shop, which is overcrowded. Another change planned is to move the Lloyd-Booth office northward to provide more room for tracks which are to be extended through the machine shop. This improvement will facilitate shipping at the works.

Power machinery will be installed before autumn at Palmyra, Pa., by the Palmyra Electric Light & Power Company, recently organized at Lebanon for the purpose of establishing a public service plant.

The Zanesville Malleable Company, Zanesville, Ohio, is building a new 25-ton melting furnace. It expects also to build a shipping room shortly, for the equipment of which industrial cars and track will be purchased.

The Pressed Steel Car Company, Pittsburgh, is installing in its Allegheny Works a 15-ton double truck locomotive yard crane, equipped with electric lifting magnet, made by the Browning Engineering Company, Cleveland, Ohio. If the operation of this crane proves satisfactory it is probable that the company will purchase several to replace lighter types of cranes.

Booth & Flinn, Pittsburgh contractors, have purchased a 10-ton crane from the McMyler Mfg. Company, Cleveland, Ohio.

The Pittsburgh & Lake Erie Railroad has placed an order with the Industrial Iron Works, Bay City, Mich., for a wrecking crane with a capacity for 100 tons, which is to be equipped with a 10-ton lifting magnet, to be added to the railroad's McKees Rocks plant.

The Hunter Construction Company, Youngstown, Ohio, has received the contract for the erection of two large buildings and steel crane runway at the plant of the Youngstown Iron & Steel Roofing Company, Youngstown, Ohio. The latter company is making some large additions to its plant, including additional hot and cold sheet mills.

The United Engineering & Foundry Company, Pittsburgh, has purchased from the Niles-Bement-Pond Company for its Youngstown, Ohio, plant, a 96-in. Bement reversing motor driven planer, with a 26-ft. table and a 7-in. single boring mill.

## Chicago.

CHICAGO, ILL., March 29, 1910.

General business has been picking up a little the past week and there are indications that the pendulum is swinging again in the direction of a more active market. Business conditions are unusually good throughout the Mississippi Valley, and manufacturers in all lines as well as buyers of machine tools are feeling more confident of the future. The large railroad lists which are pending are not only attractive in themselves, but actually represent a considerable percentage of the annual output of the machine tool industry, and lists are expected during the spring and summer from other important railroads which are making extensive shop improvements. Following is the list issued by the commissioners of the Transcontinental Railway, Ottawa, Can., for the Winnipeg shops, on which a deposit is required of 10 per cent. on all bids submitted:

### The Transcontinental Railway List.

*Frog and Track Shop.*

One 18-in. double head traverse shaper; one frog slotting machine, 12-in. stroke; one cold cut-off saw.
One 14-in. double emery; one 200-lb. strap hammer with crane, belt driven; one 125-lb. strap hammer, with crane, belt driven; one 16-in. shaper.
One 14-in. bolt lathe; one 18-in. engine lathe with taper attachment; one 24-in. drill; one 6 x 36 in. grindstone; one milling machine.
One frog and switch planer, motor driven; one No. 1 punch and shears with 25-in. throat, motor driven; one No. 0 bulldozer, with crane, motor driven.
One rail bender for rails up to 100 lb., motor driven; two 36-in. radial drills, motor driven; two 36-in. planers, motor driven.
One three-spindle drill, motor driven; one cut-off saw, motor driven; one 12-in. spread jaw pneumatic riveter.

*Locomotive Shop.*

One 26-in. engine lathe; one 28-in. engine lathe with taper attachments and 7 ft. between centers; one double emery grinder; one 26-in. by 12-ft. bed engine lathe.
One 14-in. bolt lathe with taper attachments; one 16-in. shaper; one 60-in. radial drill; one 32-in. engine lathe; one 30-in. engine lathe; one No. 2 horizontal boring mill.
One 50-ton forcing press; one 52-in. vertical boring machine; one 42-in. vertical boring machine; one 36-in. planer; one piston grinder; one double emery grinder.
One 36-in. radial drill; one 16-in. bolt lathe with taper attachment; one 66-in. radial drill; one 48-in. radial drill; one 50-ton forcing press.
One 16-in. engine lathe with taper attachment; one centering machine; one milling machine; one 18-in. emery grinder; one disk grinder; one link grinder.
One 16-in. traverse shaper; one 10-in. slotter; one 20-in. lathe with taper attachment; one 16-in. engine lathe with taper attachment; one 20-in. planer; one 14-in. drill.
One 4-in. hack saw; one buffing machine; one universal grinder with all attachments; two 16-in. engine lathes with taper attachments; one 18-in. engine lathe with taper attachments.
One grindstone; one 16-in. universal shaper; one 14-in. tool lathe with taper and relieving attachments; one six-spindle drill; one two-spindle drill.
One 18-in. tool lathe with taper attachments; one 14-in. tool lathe with taper attachment and full set of draw-in collets; one twist drill grinder; one reamer grinder with all attachments; one tool grinder.
One 12-in. speed lathe; one 22-in. engine lathe with taper attachment; one milling machine; one 3 x 36 in. turret lathe, hollow hex., with all attachments.
Two 4-in. hack saws; one 2 x 24 in. turret lathe, hollow hex., with all attachments; one automatic lathe; one centering machine; six 14-in. bolt lathes with taper attachment.
One emery wheel; one two-spindle drill with pump and c'p'd table; one six-spindle drill; one nut facer, hollow hex., with all attachments.
One nut facer with complete set of arbors and bolt pointing attachment and pump; one 2-in. bolt cutter with dies for 1½ in. and 1¾ in.; one 1½-in. screw machine.
One 2-in. four-spindle nut tapper; one 14-in. bolt lathe with taper attachment; one 16-in. bolt lathe with taper attachment.
One centering machine; one 1½-in. triple head bolt cutter; one six-spindle drill; one 16-in. engine lathe; one 30-in. engine lathe with taper attachment.
One 2-in. triple head bolt cutter; one six-spindle staybolt threader and grinder; one grindstone; one 16-in. shaper; two 27-in. planers.
One 20-in. engine lathe with taper attachment; one 2-in. spindle drill with pump and c'p'd table; one 36-in. vertical boring machine, rapid production, with side head.
One 32 x 54 in. engine lathe with taper attachment; one 36-in. engine lathe; one 30-ton forcing press; one 48-in. radial drill; one guide bar grinder; one grindstone.
One double emery grinder; one 36-in. boring mill vertical turret attachment for boring and turning locomotive rod bushes; one 32-in. drill.
One 20-in. engine lathe with taper attachment; one 37-in. boring mill; one 18-in. engine lathe; four 18-in. monitor lathes with geared head and attachments.
One 2-in. spindle miller; one 18-in. monitor lathe with taper attachments; one 24-in. radial drill; one No. 2 turret drill; one 14-in. shaper, crank driven.
One 18-in. engine lathe with taper attachments; one 16-in. monitor drill with taper attachments; one buffing machine; one cock grinder; one bench grinder.
One 6-in. hand rolls; one hand lever flanging clamp, 8 ft. between housings; one 7-ft. belt driven bending rolls; one four-spindle drill; one punch and shear; one grinder.
One axle lathe with crane; one axle lathe; one four-spindle drill; one six-spindle staybolt threading machine; one 48-in. rod drill; one small punch; one 12-in. slotter.
One double emery grinder; one 24-in. drill press; one flange clamp, 12 in. between housings; one two-spindle drill; one 25-ft. plate planer; one 80-in. wheel lathe.
Two 36-in. car wheel boring machines; one cold cut-off machine; one pipe machine; one flue expander; one flue welder and swedger; one hot saw and expander.
One cut-off machine; one staybolt nipper; one pneumatic staybolt breaker; one flue cleaner, motor driven; one 32-in. draw cut shaper with crane, motor driven.
One 12-in. slotter, motor driven; one 60-in. planer, motor driven; one 24-in. slotter, motor driven; one 96-in. boring mill, motor driven; one extension gap lathe, motor driven.
One radial drill, motor driven; one 600-ton hydraulic wheel press, inclined type, motor driven; one 90-in. driving wheel lathe, motor driven.
One 85-in. quartering machine, motor driven; one 80-in. wheel lathe, motor driven; one 36 x 36 in. milling machine, motor driven; one emery wheel, motor driven.
Two 60-in. planers, motor driven; one No. 5 combined milling machine, motor driven; one 26-in. draw cut shaper with crane, motor driven.
One 30-in. draw cut shaper with crane, motor driven; one 72-in. vertical boring mill, motor driven; one 42-in. vertical boring mill, motor driven; one 18-in. slotter, motor driven.
One draw cut cylinder planer, motor driven; one 60-in. radial drill, motor driven; one special cylinder borer, motor driven; one 18-in. vertical miller, motor driven.
One type S, locomotive rod boring machine, motor driven; one 26-in. draw cut shaper, with crane, motor driven; five emery grinders, motor driven; one flue cleaner, motor driven.
One single end punch and shear, motor driven; one 42-in. car wheel lathe, motor driven; one 200-ton hydraulic wheel press, motor driven.
One car box borer, motor driven; one 14-ft. horizontal bending rolls, motor driven.
One No. 3 wall radial drill, motor driven; two triplex 3 x 8 in. hydraulic pumps, motor driven; one rotary beveling shear, motor driven.
Seventeen pneumatic air drills, complete with drills, reamers, chucks, &c., and 50 ft. of plain rubber hose good for 150 lbs. air pressure.
Five pneumatic heavy air drills, complete with drills, reamers, chucks, &c., and 50 ft. of plain rubber hose, good for 150 lb. air pressure.
Fifteen pneumatic air chipping hammers, complete with chisels, hammers, &c., and 50 ft. of plain rubber hose, good for 150 lb. air pressure.
Six pneumatic heavy air chipping hammers, complete with chisels, hammers, &c., and 50 ft. of plain rubber hose, good for 150 lb. air pressure.
Three pneumatic heavy air riveters, complete with various size cup hammers, &c., and 50 ft. of plain rubber hose, good for 150 lb. air pressure.
Twelve pneumatic tube expanders, complete with full sets of mandrels and rollers for flue tubes; three pneumatic holders-on; one pneumatic triple valve testing machine, complete.
One exhaust fan and motor as specified; one blower and motor in boiler and tank shop as specified; one blower in flue shop, as specified.
One 61-in. throat horizontal hydraulic punch; one 560-ton hydraulic forging press, four-column type; one 12 x 15 in. hydraulic accumulator; one 17 ft. 6 in. gap riveter.

*Locomotive, Carpenter and Pattern Shop.*

Two patternmakers' lathes; one face lathe; two band saws, belt driven; one wood trimmer; one small planer, 24 in. wide.
One combined grindstone and revolving oilstone; one glue pot; one knife grinder; one universal saw bench; one two-spindle shaper; one planer, molder and matcher, 24 in. wide.
One band saw, belt driven; one cut-off saw, M. D.; one combined grindstone and revolving oilstone; one two spindle shaper; one 24-in. hand planer; one three-spindle boring machine.
One wood lathe; one No. 2 tenoning machine; one wood trimmer; one glue pot; one swing cut-off saw.
Two woodworking air drills, with bits, chucks and 50 ft. of plain rubber hose good for 150 lb. air pressure.

*Forge Shop.*

One cutting-off and centering machine; one 3½-in. forging machine; one 1½-in. bolt machine; one emery grinder; one 200-lb. hammer, S. F.; one 1250-lb. hammer, S. F.
One 1500-lb. hammer, D. F.; one 3000-lb. hammer, D. F.; one 3300-lb. hammer, S. F.; one 200-lb. hammer, S. F.; one 3500-lb. hammer, D. F.
One 5000-lb. hammer, D. F.; one alligator shear, motor driven; one combined nibber and trimmer, motor driven; one tapering rolls, motor driven; one hydraulic bulldozer.
One vertical hydraulic shear with blade parallel to frame; one hydraulic bar shear; one hydraulic squeezer; one hydraulic spring bender; one hydraulic punch; one hydraulic band remover.

*Miscellaneous Tools.*

Thirty bench vises; 60 solid box vises, 6-in. jaw; 18 heavy railroad trucks; six 50-ton; six 40-ton, six 35-ton and six 25-ton capacity jacks.
Two complete sets of staybolt taps and reamers; two complete sets of pipe dies and stocks, best make; two complete sets of taps and stocks for same.
Two pipe cutters, ⅛-in. and 2-in. capacity; two pipe cutters, 1¼-in. to 3-in. capacity; 25 tommy bars, 3 ft. long, ⅞-in. hex., iron; 10 chisel bars, 4 ft. long, 1-in. hex., iron.
Fifteen pinch bars, 4 ft. long, 1-in. hex., iron; 18 sledges, 10-lb. head, complete, with handles; eight sledges, 14-lb. head, complete, with handles.
Twenty-five full sets of double end wrenches, ¼ to 3 in. jaws; 25 full sets of box wrenches, ⅝ to 1¼ in.; 25 ratchet drill stocks, with full sets of drills, chucks, &c.
Two surface blocks, 6 ft. wide by 9 ft. long; four oil burners, ¼-in. oil inlet pipe, ½-in. compressed air connections, both fitted with control valve, mixing valve and frame horn complete, the whole to be arranged on a light ⅝-in. bar iron stand 2 ft. 6 in. high.

Thirty anvils, with stands; 16 14-lb. sledges, complete; 15 full sets of blacksmiths' tools; two blowers and motors.

*Tin Shop Equipment.*

One No. 3 stove pipe former, 2 x 31 in.; one 30-in. tin folder; one No. 7 31-in. stove pipe folder; one 31-in. foot squaring shears; one No. 2 19-in. circular shears.

One No. 1 brass mounted groover, 20-in.; one encased setting-down machine; one encased wiring machine; one encased large turner; one encased small turner.

One encased large burr; one encased small burr; one No. 4 beading machine; two pairs bench shears, No. 2; one raising hammer, No. 2 (steel).

One raising hammer, No. 4 (steel); one set hollow punches: ½, ¾, 1, 1¼, 1½, 1¾; six pairs No. 18 combination snips; one No. 3 oval slide vise.

Three dangler gasoline soldering furnaces; three hand groovers, Nos. 0, 2 and 4; one No. 2 break-horn stake; one No. 2 double seaming stake; one common blowhorn stake.

One candle mold stake; one No. 1 bottom stake; one common square stake; one No. 4 hatchet stake; one No. 2 hollow mandrel stake; one round head stake.

One No. 8 slip roll former, 2 x 37 in.; one No. 2 foot squaring shears; one No. 9 S. I. folder, 37 in.; one No. 2 can top folder; one No. 2 bench plate, 30 x 8 in.

One No. 2 foot gap squaring shears; one No. 4 double seamer; one No. 1 cutting nippers; one No. 9 circular hand shears; one pair double cutting snips.

Three No. 0 riveting hammers; one No. 2, one No. 3, one No. 4, one No. 5, one No. 6 and one No. 7 rivet sets; one No. 71 lever punching press; one gasoline blow torch.

One set 72-in. rolls; one pair trammell points; one pair compasses, 10-in.; one pair compasses, 6-in.; one steel square; one pair 7-in. electricians' pliers.

One crimping roll for No. 4 beading machine, to be quoted in lump sum.

The John B. Morris Machine Tool Company, Cincinnati, has recently redesigned its geared head engine lathe, which is now made in four sizes, 14, 16, 18 and 20 in. This lathe is handled in Chicago by the A. D. White Machinery Company and the improvements made in it have proved very popular with Western buyers.

Sealed proposals will be received by the City of Chicago until April 4 at room 705, City Hall, for furnishing and delivering one universal milling machine No. 2 at the water works shops, 2304 South Ashland avenue.

J. D. Freese & Son, Chicago, have had plans prepared for a new factory building.

From Springfield, Ill., it is reported that the Eclipse Engine & Machine Company, Keithsburg, Ill., will remove there as soon as proper facilities can be provided.

The Pike Gate Company, Pittsfield, Ill., has been incorporated with capital stock of $50,000 by Geo. I. Hendrick, James Carroll, Jacob D. Hess and Portis P. Shaw. The company will manufacture patent gates and farm machinery.

The Interurban Electric Company, Carterville, Ill., will install a number of transformers for reducing line voltage to service pressure on its lighting system.

The Rajah Mining Company, Benton, Wis., which is expected to be one of the plants served from the large electric station at Galena, Ill., has added to its working capital and will provide new power and concentrating machinery. This is urgently needed to take care of the present production.

The Morehouse & Wells Company, Decatur, Ill., will erect in the near future a six-story fireproof building at a cost of about $85,000, for its wholesale and retail hardware business. The new building will be equipped with an electric light plant, a sprinkler system, two freight and one passenger elevator, none of which has been purchased.

The shops additions to be made by the Chicago, Indianapolis & Louisville Railway in connection with its repair works at Lafayette, Ind., will be equipped with motor-drive throughout on lines similar to those followed in the layout of the Big Four shops at Beech Grove, near Indianapolis, Ind. An enlarged power plant will be required and steam turbine units may be installed.

The Union Sanitary Mfg. Company, Noblesville, Ind., is erecting an addition to its factory at a cost of about $15,000. The new addition will be 50 x 175 ft., and will be used for a warehouse and other purposes.

The Creamery Package Mfg. Company, Chicago, is installing an ice plant at Lindsborg, Kan., of 10 tons capacity.

The Bartholomew Company, Peoria, Ill., manufacturing automobiles, is having plans prepared for a factory building 140 x 240 ft., one story, with saw tooth roof, mill construction.

C. M. Hurst, president of the Hurst Automatic Switch Company, Rawlins, Wyo., is negotiating for the purchase of 20 acres of land in St. Louis, Mo., to be used as a site on which the company will erect a plant at a cost of $125,000, for the manufacture of the Hurst automatic switch. The officers of the company are C. M. Hurst, president; James H. Coluse, vice-president; T. A. Ready, secretary; John Doty, treasurer, all business men of Rawlins.

The Central Machinery Company, Chicago, has been incorporated with capital stock of $5000, to do a general machine shop and foundry business and deal in building materials by Henry Roth, Edwin F. Masterson and Albert G. Rosenbaum.

The Arctic Ice & Cold Storage Company, St. Louis, Mo., recently organized and capitalized at $500,000, will erect a plant near Mill Creek Valley in that city at a cost of $148,000, having a capacity of 100 tons of ice per day. The officers of the company are F. C. Laufketter, president; W. P. Bennett, vice-president; Dr. E. J. Lee, secretary and treasurer.

Return tubular boilers having a total capacity of 500 hp., with accessory equipment, will be purchased in the near future for the electric power and pumping station at Bremen, Ind.

The Anderson Electric Light Company, Anderson, Ind., is said to have decided upon the installation of a new battery of boilers and a steam turbine generating set of 1500 hp. capacity, together with considerable auxiliary apparatus.

The Moline Lime, Stone & Cement Company will install in its plant at Marion, Ohio, a set of heavy crushing rolls, power apparatus and other equipment to provide for the capacity required there.

An electric generator of 1200-kw. capacity, for direct current, which will be driven by a cross compound Corliss engine, has been decided upon for the power house of the Marquette Cement & Mfg. Company's mills at La Salle, Ill.

The Streator Heat & Light Company has been incorporated at Streator, Ill., to operate an electric power plant, lighting and heating system. Large boiler capacity will be needed, but definite arrangements have not yet been made.

The city of Urbana, Ill., will be in the market for a boiler of moderate capacity. The type desired is not stated.

The A. J. Stillwell Company, Hannibal, Mo., is reported to be in need of power and refrigerating machinery, the particulars of which can be best learned by direct inquiry.

Plans for the rebuilding of the Excelsior Foundry Company's plant at Peoria, Ill., which recently burned, will provide for larger capacity and a line of thoroughly modern equipment.

The Indestructible Wheel Company, recently reorganized at Lebanon, Ind., has bought the A. M. Lofland machine shops and consolidated them with its own plant. Besides making steel wheels for trucks, the company will do a general automobile repair business and machine shop work. George T. Miller is president, Bert Winters, secretary, and A. M. Lofland, superintendent.

The Double Fabric Tire Company has been organized at Auburn, Ind., and incorporated with $10,000 capital stock, to manufacture automobile accessories. The directors are Wm. H. Willinner, V. L. Willinner, A. L. Murray and L. H. Murray.

The Board of Trustees of the Indiana State University, Bloomington, Ind., has approved the plan of the committee for a new water plant for the University, to cost $20,000. It will consist of two pumping stations and a three-mile pipe line.

The Butler Concrete Machinery Company has been organized at Butler, Ind., to manufacture concrete machinery. The directors are Fred Countryman, L. C. Buehrer, F. W. Swantusch, T. A. Hoffman and L. C. Harding.

The National Mfg. & Sales Company has been organized at Marion, Ind., and incorporated, with $300,000 capital stock, to manufacture carpet sweepers. The directors are C. L. Backus, E. L. Marker, D. M. Corser, R. M. Tefft and R. A. Rogers.

The Bloomington & Ellettsville Stone Company has been organized at Bloomington, Ind., with $50,000 capital stock, to quarry and manufacture stone. The directors are Matson Williams, J. R. Williams, Jr., U. A. Johnson, W. H. Sears and T. A. Faulkner.

The Rawlings Mfg. Company, C. W. Scudder, president, St. Louis, Mo., is erecting a three-story factory building, 40 x 145 ft., for which special equipment necessary in the manufacture of athletic goods will probably be required.

The Vincennes Motor Company, Vincennes, Ind., is completing a new concrete building in which machinery will be installed for the manufacture of marine engines.

The Ansted Spring Works, Connersville, Ind., destroyed by fire March 19, will be rebuilt.

The Coddington Mfg. Company has been incorporated at New Albany, Ind., with $80,000 capital stock, to do a general manufacturing business. The incorporators are G. D. C. Coddington, Walter E. McCulloch and Adolph Day.

## Cincinnati.

CINCINNATI, OHIO, March 29, 1910.

One of the most encouraging features of the closing days of March in the machine tool trade is found in the number and character of inquiries. This also holds true of the trade in metal working machinery and electrical power units. Not for many years has the Cincinnati market seen so much evidence of expansion. In this connection some expressions of Cincinnati machine tool manufacturers in regard to statements contained in a printed circular sent out recently by one of our contemporaries are interesting. The circular in question reproduced the views of a number of European correspondents to the effect that the larger European manufacturers of tools are crowding out the American makers, whose products have been extensively sold in Europe.

The Cincinnati *Enquirer* of March 28 contains interviews with S. P. Egan of the J. A. Fay & Egan Company, William Lodge of the Lodge & Shipley Machine Tool Company, C. Wood Walter of the Cincinnati Milling Machine Company and August H. Tuechter of the Cincinnati-Bickford Tool Company. The *Enquirer* says: "As Cincinnati is the largest machine tool manufacturing city in the country, it would be the first to feel the effects of such a damaging competition. A careful canvass was made by the *Enquirer* and in no instance was there any manufacturer who would admit that such was the case. They do say that competition is sharper, but they have no fears of being driven from the markets entirely because of their faith in the superiority of the American machine."

Mr. Egan in his statement recalled his study of the Chicago Exposition, where he saw in the German exhibit types of machinery that had been placed on the American market 15 years previously, and noted that, while the Germans are enterprising, by comparison with the present American made product in tools and woodworking machinery they suffer just as much as they did then. Mr. Lodge called attention to the presence in this city at this time of three buyers from Germany and recently of one from England, and added: "It is true that for a while the foreign business was low, but this was due to the panic conditions all over, which struck there about the same time that they depressed business in this country." Mr. Walter said: "The foreign market is a very large one, and the American maker of up-to-date machinery will always find a ready sale of his product. Of course, German competition is keen, but the American machine keeps so far in advance of the European machine that it commands the sale over the German competitor, or the English and French, for that matter." Mr. Tuechter made a strong point of the possibilities which enable American ingenuity to keep ahead; in other words, when an American product had made enough of an impression in Europe to be deemed worthy of copying, the American maker had a new machine on the market.

Worthy of special note are the rapidly improving conditions among the manufacturers of forming, punch and toggle presses and corrugating machinery. All manufacturers in this line are exceedingly busy, and inquiries are accumulating. One large local concern states that it is unable to secure enough skilled help and is working to its full capacity.

It is in the machine tool trade particularly that evidences are strongest of building expansion. New buildings are either in the course of erection or planned for the following: Cincinnati-Bickford Tool Company, M. L. Andrew, manufacturer of wood boring machinery; Straub Machinery Company, Laidlaw-Dunn-Gordon Company, Cincinnati Planer Company, Cincinnati Milling Machine Company and Cincinnati Grinder Company (seeking location in some new building); the Hisey-Wolf Machine Company and the John B. Morris Machine Tool Company.

The Hisey-Wolf Company, manufacturer of portable electrical tools and grinders, has purchased a tract at the southwest corner of Colerain avenue and Marshall street, 92 x 162 ft., and will erect at once a new factory. The building will 80 x 160 ft., brick, two story. The rapid increase in the company's business necessitated taking larger and more commodious quarters, where the force of workmen can be increased. The output, which is at present confined to drills of 2 in. and grinders of 2 hp. capacity, will be doubled, and the line may be added to. The power will be electric throughout and efforts will be made to have the plant ready for operation this fall. The company has within the past year acquired considerable additional machinery, such as planers, twist drill grinders, internal grinder, lathes, milling machines, upright drills, gear cutters and turret lathes, but may find it necessary to add a few new machines. The president, Walter J. Friedlander, who took hold of the business in July, 1908, and began early in 1909 to increase the line, has made a splendid record, which is all the more notable, recalling the business depression which existed the greater part of the time.

Plans for the new shops of the John B. Morris Machine Tool Company, which was recently capitalized for $125,000 by stockholders and directors of the John B. Morris Foundry Company, are completed and bids will probably be ready to let this week. The new factory will adjoin the foundry at Court, Harriet and Vogt streets on the south and will run 250 ft. west, containing a wing 75 x 117 ft., two stories, to be built of reinforced concrete with provisions for a third and fourth story later. The power is to be furnished by two 135 hp. gas engine units and the entire machine shop will be driven by motors on separate line shafts, the machines to be mounted directly under the line shafts and driven by friction pulleys, doing away with practically all counter shafts. The new machinery needed has practically all been contracted for; two large planers being a recent purchase. The present line comprises cone and geared head Schellenbach lathes and radial drills, which will probably be increased. The company hopes to be in its new quarters in August. George McG. Morris is president and treasurer, and S. M. Blackburn is secretary.

The J. M. Robinson Mfg. Company, maker of sheet and metal working machinery, notes that inquiries are of substantial character and are increasing; and that it is difficult to get sufficient skilled help. Recent shipments include a 12-ft. corrugating roll to Dallas, Texas, an 8-ft. toggle press to a Pennsylvania point, and five special sized punch presses to Cincinnati parties.

Plans are being made by the Big Miami Valley Development Company for a project which is destined to harness the undeveloped power of the Big Miami River and establish a manufacturing centre near Cleves, Ohio. Morgan Wamsley of Cleves is president of the company.

The Dayton Steel Construction Company is a new incorporation for Dayton, Ohio; incorporators, Perry M. Keplinger, Charles E. Foreman, R. Sherman Shonk and Roger Lint; capital, $25,000.

It is reported, unofficially, that the Pittsburg Equipment Company has taken an option on 50 acres of land near Yorkville, Ohio, and that a large manufacturing plant is under consideration.

The Seneca Wire & Mfg. Company, Fostoria, Ohio, is installing machinery in the recently finished addition to its plant, which is an exact duplicate of the original buildings.

The Cincinnati Iron and Steel Company, Cincinnati, Ohio, has made the following sales: Compressed Wood Preserve Company, Cincinnati, one 10-ton, 27 ft. span crane; Clifton Springs Distilling Co., Cincinnati, two 12-ton, 21 ft. span cranes; Lunkenheimer Company, Cincinnati, one 3-ton, 25 ft. span and one 5-ton, 25 ft. span; L. F. Parks, Cincinnati, one milling machine; Xenia Supply Co., Xenia, Ohio, one alligator shear. The company has had a large number of orders coming in for its new 14-in. lathe, and has had to purchase additional machine tool equipment, consisting of a Landis grinder, a Jones & Lamson lathe, a Whitcomb-Blaisdell planer, two additional lathes and other minor tools. It is also receiving numerous orders for its hoist holders.

## Cleveland.

CLEVELAND, OHIO, March 29, 1910.

Business with the local machine tool houses during the past week has continued light. Some of the dealers report a fair volume of small orders, but nearly all of these are for single tools. No large or even fair sized inquiries have come out. What new business that is developing is coming from various sources, no demand from any particular industry predominating. Very little has come from the automobile industry during the past month, although orders for small lots of tools have been received from this trade for delivery next fall. The condition of the automobile trade in Ohio and Michigan continues very satisfactory and dealers expect to sell all the cars they can manufacture this year. A number of new companies for the manufacture of automobiles have been organized recently, but some of these will get their plants running only in a very small way, if at all, this year, one of their principal handicaps being that they are unable to contract for parts for this season's delivery. The demand for second-hand tools is fairly active and good used tools are bringing excellent prices.

Local machine tool manufacturers report a fair and steady run of orders, which about keeps up with shipments, so that, as a rule, no better deliveries are being promised. The demand for special and heavy machinery continues good and the future is encouraging. The general situation among various industrial plants in metal working lines is very satisfactory and most plants are running about full. Local manufacturers of twist drills state the inquiry for their products is very good. Engineering firms are figuring on a large amount of new construction work in the line of new manufacturing plants and additions.

The foundry trade generally has about all it can do taking care of orders for iron castings.

The Board of Education of Cleveland has decided to establish a temporary technical training department in the Lincoln High School which will accommodate pupils during the coming school year until the new West Side Technical High School, which is now being planned, can be built. The list of machine tool requirements for the temporary school has not yet been prepared, but it is expected that the necessary equipment will be purchased during the summer. The Board of Education has just issued a list of small tool requirements for the present Technical High School at East Fifty-fifth street and Scovill avenue. These tools will be purchased during the next few weeks. The list includes calipers, center reamers, cutters, chucks, dies, dogs, dividers, drills, emery wheel dressers, files, gauges, indicators, knurling tools, scribers, reamers, screw plates, shears, tool holders, wrenches, vises, &c.

The Star Machine Company, Cleveland, has been formed by J. B. Eck and others to engage in a general machine shop business. The company has opened a shop in the Richardson Building on High avenue. All the machinery equipment needed for the present has been purchased, but the company

expects to be in the market for additional machine tools a little later.

The Barndt & Johnston Auto Supply Company, Columbus, Ohio, which recently increased its capital stock to $150,000 and now occupies a plant on East Donaldson street for the manufacture of automobile bodies and accessories, has purchased the factory at High street and Kingston avenue that has been occupied by the Columbus Woodenware Company and will remove to its new location as soon as the building can be fitted up for its use. The building is two and three stories high and about 150 x 400 ft. The new plant will enable the company to largely increase its output. C. Christian Born is president; Walter R. Johnston, vice-president, and Charles F. Barndt, secretary and treasurer.

The A. B. C. Castings Company, Cleveland, which was recently organized to build a plant for the manufacture of aluminum, brass and bronze castings, has effected its organization by the election of the following officers: President, I. Levy; vice-president, T. L. Johnson; secretary and treasurer, A. D. Levy; general manager, H. E. Behr.

The Bidwell Screw Company, Cleveland, has been organized, with a capital of $200,000, to establish a plant for the manufacture of screws. The company is located temporarily on Carnegie avenue. The incorporators are N. S. Bidwell, E. P. Mitchell, S. L. Pierce, Harry L. Vail and W. S. Spaulding.

The Permanent Nut & Bolt Company, Cleveland, has been incorporated, with a capital of $50,000, by Ralph D. Stephenson, T. S. Dunlap, W. F. Abel and M. H. Nason. The company controls patents on a new bolt and nut. It is not the present intention to establish a manufacturing plant.

The Taylor Steel Company, which was recently organized by residents of Columbus, Ohio, has built and placed in operation a new steel castings plant at Plain City, Ohio. J. H. Culbertson is president, and V. A. Taylor is secretary and manager.

The Electric Controller & Mfg. Company, Cleveland, has increased its capital stock from $350,000 to $1,000,000.

The Fulton Engine Company, Erie, Pa., is in the market for a 2-in. turret lathe and a horizontal boring machine.

The Thew Automatic Shovel Company, Lorain, Ohio, has an inquiry out for a 2-in. bolt cutter.

The Bonnet Company, Canton, Ohio, is meeting with a large demand for its improved type of pulverizer.

## Milwaukee.

MILWAUKEE, WIS., March 28, 1910.

Inquiries among local manufacturers of machinery develop the fact that orders received during the past week have run more to large contracts than for any similar period within the last two months, some unusually heavy bookings having been made. This seems to be due principally to the active resumption of work on extensions and new building projects that has taken place simultaneously with the arrival of warm weather, and also to a feeling that political conditions for this session of Congress at least are becoming more settled than they have been. A number of large issues of bonds for new construction and improvements have been sold lately in various parts of the country, being principally taken by local capital, and this has in each instance been reflected at once in the closing of contracts for machinery. The latter is, as a rule, urgently needed, or will be by the time it can be installed; hence favorable terms of delivery continue to have a preponderating influence in effecting sales.

Western railroads have in abeyance a number of large lists of machine tools, power plant machinery, motors, belting, shafting, &c., which must be submitted for tenders in the very near future if they intend to proceed with plans for new shops and additions as announced; and they are already buying considerable equipment in small lots, a part of which will be utilized for repair work at roundhouses and other junction points where rolling stock is overhauled.

One of the most significant signs of the times is the tremendous activity displayed by fabricating plants of every description. Every shop in the Northwestern States, whether large or small, has practically all that it can do, and it may be safely said that each of these concerns is planning an increase of facilities to be made either now or by fall. Such plants will be rushed all through the spring months, and there seems very little likelihood of any let-up during the summer or early autumn. More attention than ever is being directed toward reinforcement material, not only for buildings, bridges, culverts, &c., but also for numerous other forms for which concrete is now being used, such as tunnels, water conduits of large diameter, foundations for power units carrying supply and exhaust mains integral with themselves, intakes, hollow dams, &c. Problems involving steel and concrete now go hand in hand to such an extent that a number of concerns in this part of the country who have heretofore devoted themselves entirely to metal structures are now combining the two, with consequent modification and enlargement of their equipment. In this connection the manufacture and use of steel centering forms has added a new phase to the industry.

Allusion has heretofore been made to the heavy demand for woodworking machinery of every description, including sawmill and planing mill equipment. This constituted one of the strong supports of the general machinery market during the recent lull in buying, particularly as affecting dealers; and, if anything, it continues to increase. Announcement is made daily of plans for new plants or extensions for which an extensive line of apparatus is required. The larger percentages of these seem to be in the Southwestern States and the Pacific Northwest, but the remainder are scattered very evenly over the country, indicating that the heavy demand for construction material is not confined to any section or even locality. Cement products also share in this demand, and those who supply machinery for their manufacture or utilization are fully as busy as the others above mentioned.

The new works of the Milwaukee Stamping Company, West Allis, Wis., to replace those that burned, will provide about 17,000 sq. ft. of floor space. The boilers formerly used can again be put in service, but a new power unit and operating machinery will need to be purchased.

A boiler and an engine, preferably second-hand, with foundry apparatus, tools for machining, grinding, polishing, &c., will be required for a new factory 100 x 160 ft. to be erected for the Garage Equipment Company, Milwaukee.

A Corliss engine of 350 hp. and other machinery is being installed by the Stearns Lumber Company, Mellen, Wis. Some further additions may be made in the fall, although nothing more has been definitely decided upon.

The American Car & Foundry Company, in connection with plans for increasing the capacity of its power plant, has just placed an order with the Allis-Chalmers Company for a single tandem gas engine coupled to a 250-kw. generator for direct current. Natural gas is available.

At the Maintenance of Way Convention in Chicago the Beaver Dam Malleable Iron Company, which is now operating to largely increased capacity, was represented with an exhibit of tie plates and rail braces of its manufacture.

A new factory building is to be erected this summer at Appleton, Wis., by the Appleton Chair Company. No announcement as to the equipment proposed has as yet been made.

E. C. Sweet & Son, Reedsburg, Wis., have opened a machine shop for repairs in connection with their automobile business, and will probably be in the market at intervals for additional apparatus.

The Fairbanks-Morse Mfg. Company, Beloit, Wis., are putting out an engine driven hoist for contractors' service which can be operated on gasoline, kerosene or alcohol, making it particularly convenient for places where bulkier fuel cannot be readily obtained.

A new manufacturing industry known as the Beaver Silo & Box Mfg. Company has been organized at Beaver Dam, Wis., and will construct a two-story plant 40 x 100 ft. Power equipment and woodworking machinery will be needed.

Two large additions will be built in the near future to the factory of Radford Bros. & Co., Oshkosh, Wis., and new machinery installed.

Among the concerns that have already contracted to use power from the Northern Hydroelectric Company's plant at High Falls, on the Peshtigo River, are the Henry Rahr's Sons Company, the John Hoberg Company, the Green Bay Paper Company and the Northern Paper Mills, all of Green Bay, Wis. The result of the new system will be, among other things, to create a large demand for electric motors.

The McDonough Mfg. Company, Eau Claire, Wis., has been given the contract for machinery to be installed in the new plant of the Peavy-Burns Company at Kinder, La. This, however, covers only the equipment of the sawmill. Orders for the planing mill, including probably electric motors, remain to be placed.

The E. B. Hayes Machine Company, Oshkosh, Wis., has completed plans for a new machine shop 60 x 240 ft. for the manufacture of pattern shop and woodworking machinery. The equipment has not yet been fully decided upon.

The Little Engineering Company, Fond du Lac, Wis., has been intrusted with the preparation of plans for the new plant of the Gardner Machine Company, Beloit, Wis. It will be of concrete, two stories, 40 x 100 ft.

The Baker Mfg. Company, Evansville, Wis., will install a number of electric motors for machinery drive.

The C. Mattison Machine Works, Beloit, Wis., will considerably increase its capacity by means of the addition to be completed this spring. Most of the equipment needed is understood to have been provided for.

Work is about to begin on a four-story addition to the plant of the American Mfg. Company, Sheboygan, Wis. It will be 70 x 70 ft., of mill construction, and equipped with machinery.

The Fred Prescott Steam Pump Company, West Allis, Wis., will install a 6,000,000-gal. pumping engine for the Joplin, Mo., water works.

The Wisconsin Light & Power Company is planning to enlarge the capacity of its power development at Birchwood,

Wis., where a concrete dam 4 ft. higher than the present structure will be built.

The Nelson Foundry Company, Milwaukee, has increased its capital and will take steps during the year to enlarge its facilities.

The Berlin Machine Company, Berlin, Wis., among contracts recently filled, has installed five of its woodworking machines in the plant of the J. J. McCaskell Lumber Company, Freeport, Fla.

The Rock River Machine Company, Janesville, Wis., is having plans drawn for a new shop to be used in the manufacture of punching and shearing machinery. Some equipment additional to that now in service will be needed and has been partially ordered.

Ebenreiter & Hildebrand, Sheboygan, Wis., are increasing the capacity of their woodworking plant by an addition 25 x 60 ft., in which a shaper, planer, boring machine and two combination saws will be installed, together with motors, the shop being electrically operated.

The J. S. Rowell Mfg. Company, Beaver Dam, Wis., has let contracts for the construction of two new buildings, a forge shop and a woodworking plant, which will be 50 x 75 ft. and 50 x 50 ft., respectively. Some additional machinery is to be provided.

The Gilson Foundry Company, which is now operating in leased quarters at Port Washington, Wis., will remove to a better location at Kewaskum, Wis., where a foundry is being remodeled for its use.

Four new buildings, 80 x 140 ft., 40 x 60 ft., 65 x 80 ft. and 48 x 60 ft., will be built by the Columbus Canning Company, Columbus, Wis., and equipped with the most improved machinery, including driving apparatus.

The Milwaukee Steel Foundry Company, Milwaukee, is taking bids on work for a new power plant.

The Escanaba Traction Company, Escanaba, Mich., on the Upper Peninsula, will begin work this summer on another large hydroelectric power development to develop 1500 k.w. on the Escanaba River near Groos station. Purchase of turbines and generators will not need to be considered, however, for some months yet.

The Kempsmith Mfg. Company, Milwaukee, is arranging to bring its working capital up to $200,000 by an issue of $75,000 additional stock, and it is reported locally that a large expansion in the manufacturing facilities of this company may be looked for during the current year, as the business offering within the past few months has been greater in volume than the company is now equipped to handle.

Another illustration of the tendency of large manufacturing companies of this section to engage in automobile building is to be found in the absorption of the Petrel Motor Car Company's business by the Filer & Stowell Company, Milwaukee, who are known throughout the world as leading builders of Corliss engines and saw mill machinery.

A new power and timber cutting plant is to be erected in the near future by the Mosinee Land, Log & Timber Company, Mosinee, Wis. Building plans and machinery requirements have not yet been outlined.

The Frontier Mining Company, Benton, Wis., is planning to construct a power plant and to install machinery for concentrating ore.

Machinery is now being installed in the new factory of the Kenfield & Lamoreaux Company, Washburn, Wis. More will probably be needed by fall, as orders are heavy.

A new woodworking plant is being established by B. H. Cooley in leased quarters at Campbellsport, Wis., which include the use of equipment already installed.

Advices from Houghton, Mich., state that the Stone & Webster Engineering Corporation, Boston, Mass., which control the Houghton County Traction Company and the Houghton County electric light plant, are to enter upon extensive improvements, including the consolidation with these properties of a hydroelectric plant in the vicinity and the building of a new electric traction line.

President Yates of the Berlin Machine Company, Berlin, Wis., has been making a tour of the Pacific Coast, where the company has done a large business this season, trade being greater in proportion to the number of plants operated there than it has been with any other section.

The National Brake & Electric Company has completed preparations for the building of a foundry addition 80 x 200 ft. at its plant on the northeast side of Milwaukee, for which considerable new equipment will be needed.

Contracts are now being placed for power house apparatus to be installed in the new plant of the Sterling Wheelbarrow Company, which is nearing completion at West Allis, Wis. A 150 hp. boiler will be furnished by the Milwaukee Boiler Company, which has lately secured most of the orders in this locality.

The Waukesha Lime & Cement Company, Waukesha, Wis., has placed contracts for a No. 12 Gates breaker, which is among the larger sizes built, two No. 9 style B Gates elevators, one with 43 ft. and the other with 72 ft. centers, and four 400 volt, three phase, 60 cycle induction motors, varying in size from 30 hp. to 150 hp.

The Warner Instrument Company, Beloit, Wis., has broken ground for an addition, 32 x 100 ft., which will be used for plating and polishing rooms, brass foundry and garage. All necessary equipment has been ordered.

## Detroit.

DETROIT, MICH., March 29, 1910.

Local manufacturers have been less disturbed lately by the general cessation of buying, reported from the country at large, than by their threatened inability to keep up with the orders which continue to pour in upon them, particularly in view of the difficulty of obtaining skilled foundrymen and machinists. In this respect shops catering to the automobile trade, for brass and aluminum castings and finished parts especially, are having the most trying time, even with heavy drafts made upon the up-State cities and those of Ohio, Indiana, Illinois and Wisconsin, to all of which the Macedonian cry for help has gone out. The mechanical equipment in service is also insufficient for most establishments and floor space is generally lacking in which to install more. Consequently old plants and small shops heretofore devoted to other purposes are being temporarily pressed into service until additions can be built. Nor is there any rush from shop and foundry outfitters elsewhere to fill the palpable needs of manufacturers at Detroit, Toledo, Flint, Bay City, Saginaw and other cities of this immediate section. They seem to be busy getting out what orders they have already booked. A firm, healthy tone prevails everywhere in this territory, whatever the exact degree of activity manifested, and prospects for the future are most promising.

The new factory to be built at Detroit by the Hewitt branch of the Metzger Motor Car Company's business will be completed about August 1. A site of 20 acres is reported to have been secured.

A 12-in. centrifugal pump, driven by a 200-hp. motor, is to be installed at the plant of the Edw. Ford Plate Glass Company, Rossford, Ohio, for the delivery of 5000 gal. of water against a 100-ft. head. The unit has already been ordered.

Construction of a municipal electric plant of about 1000 hp. is proposed at Muskegon, Mich., and a bond issue to provide for the necessary funds will be voted on in April.

Another large foundry to be built in Detroit this year is understood to have been decided upon by the American Car & Foundry Company. It will be electrically operated throughout.

The Dake Engine Company, Grand Haven, Mich., is finding inquiries particularly strong this season for single and double drum hoisting engines, derrick crabs, &c., used in construction and development enterprises. The company is now constructing a foundry addition and is in the market for a three motor crane, 28 ft. span, to be installed in this building.

The Groveland Mining Company, Randville, Mich., will install a new crushing outfit, including a large gyratory breaker.

The Frost Gear & Machine Company has been organized to establish a manufacturing plant at Jackson, Mich. Further details have not been learned.

A new power plant will be provided this spring for the implement factory of the Gale Mfg. Company, Albion, Mich.

A pumping plant will be built at Harbor Springs, Mich., but only a unit of moderate capacity is required.

The Starr Brass Works, Kalamazoo, Mich., will be compelled before the end of the present season, by the demand for trolley wheels, to enlarge the facilities used in their production at its plant.

Commercial interests at Battle Creek, Mich., are reported to be offering a free site for a stove plate foundry, which it is believed can be advantageously located there.

It is reported locally that a new automobile concern known as the True Blue Motor Company, capitalized for $100,000, will erect a large plant in Detroit or vicinity this spring.

The Ireland & Matthews Mfg. Company, Detroit, maker of stove trimmings, sheet metal goods and automobile supplies, is adding 1200 ft. of floor space, which, when completed, will give the company a total floor space of 150,000 ft.

The Baker Drop Forge Company, Jackson, Mich., has begun the erection of a drop forging plant which is to be 60 x 172 ft., and a die shop about 60 ft. square. The building will be equipped with eight drop hammers and a full quota of trimming presses, bar shears, upsetting machines, &c., most of which have been arranged for. The company will make chiefly automobile forgings and gear flanges, and it is expected to have the plant in full operation by June 1.

The Anderson Forge & Machine Company, Detroit, is in the market for boiler equipment which is to consist of 250 hp. units, and later on will probably buy another 100 hp. unit. The boilers now wanted will be required to carry 200 lb. pressure. The company is also in the market for

eight cranes, two of 3 tons capacity and two of 5 tons capacity, to be electrically operated; one 5-ton hand crane and one 5-ton electrical crane operated on a longitudinal travel and hand operated on the hoist. The company also wants two 10-ton hand cranes. A stack about 60 ft. in diameter and 125 ft. high, of either brick or steel, will also be installed.

The Detroit Copper & Brass Rolling Mills, Detroit, is planning to enlarge considerably its present capacity and has an inquiry out for four sheet copper rolling mills and the necessary shafting and gearing.

## The Southwest.

KANSAS CITY, MO., March 28, 1910.

The opening of spring finds trade throughout this part of the country in a most flourishing condition. For general industrial purposes, including manufacturing, considerably more machinery and other apparatus is now required than at any time heretofore, and there is a marked tendency to use only the best obtainable. For temporary plants, however, such as timber cutting mills intended to last only during the season, construction work, &c., as well as for small shops in the less populous centers, a great deal of second-hand equipment is required, so that the market is broad enough to cover all classes of offerings. Automobile garages, with repair shops attached, are also becoming sufficiently numerous to constitute an appreciable factor in the buying of tools, small motors, shafts, belting, &c. Among the requirements of such establishments is a small portable air compressor, usually motor driven, for inflating tires, cleaning cars and machinery and to supply pneumatic tools in the repair department. Several manufacturers of the Middle West have been putting these small compressors on the market and they meet with ready sale.

The Kansas City Structural Steel Company, whose fabricating plant at Argentine, Kan., is the largest in the Southwest, has thus far found the season a very profitable one for structural work of all kinds, and some increase in its facilities may be looked for during the year.

A hydroelectric plant of about 2500 kw. capacity is to be built on the Guadalupe River near Seguin, Texas, by the Seguin Water Power Company.

Plans and estimates have been prepared for municipal water works at Pearsall, Texas, including a high duty pumping station, but construction has not yet been authorized.

Large engine or motor-driven pumps will be required at some time within the coming year by the Lobo Land & Irrigation Company, Crockett, Texas, for an extensive irrigation project.

An engine, dynamo and accessory apparatus will be purchased within a month or two at Medford, Okla., together with some water works equipment, including a large steel tank.

Construction of a modern incinerating plant, the heat from which will be utilized under boilers, has been decided upon by the municipal authorities at Tulsa, Okla.

T. J. Wood, Oklahoma City, Okla., has organized the Levisa Coal, Coke & Power Company, which is planning, among other projects, the construction of a large power plant driven by hydraulic turbines. Incorporation has previously been mentioned.

The Fort Smith Light & Traction Company, Fort Smith, Ark., will install in the near future a Corliss engine and generator of about 1200 hp., to furnish direct current.

Improvements in the pumping plant and water distribution system are under consideration at Weimar, Texas.

A plant equipped with boilers, special sawdust-burning furnaces, engine, shafting (or generator and motors) and woodworking machinery will be built at Oklahoma City, Okla., by the Oklahoma Millwork & Fixture Company.

Funds for the construction of water works are being provided at Cuero, Texas, and bids on pumping machinery will be taken shortly.

Equipment for operating its mines electrically, including a dynamo plant, will probably be provided this year by the Southern Anthracite Coal Company, Russellville, Ark.

An electric power plant will be installed by the city this summer at Mountain View, Okla. The machinery needed is yet to be bought.

One or more pumping units for municipal service will probably be required about May 15 at Nocona, Texas.

M. S. Martin, Hannibal, Mo., is in charge of plans for a private power plant at Dallas, Texas, for which the following apparatus is needed: Two horizontal return tubular boilers of 150-hp. each; one 150-kw. engine-driven generating set for direct current, heater, feed pump, house pump and accessory equipment.

The city of Portales, N. M., has let the contract for installation of an electric power plant there. Later additional machinery will be purchased.

The shops of the Kansas City, Mexico & Orient Railway at Farview, Okla., which were destroyed by fire, will probably be rebuilt along more extensive lines.

Boilers having furnaces especially designed for burning Texas lignite are being installed by the Citizens' Railway Company, Waco, Texas. Mechanical stokers will be used. Following the trial run a series of tests will be made under the supervision of fuel experts to determine the efficiency of the arrangement. The boilers are intended to develop 1000 hp.

Pumping machinery will be purchased shortly for installation in the municipal plant at Russellville, Ark., plans for which have just been completed. The Fuller-Coult Company, St. Louis, Mo., are in charge of specifications.

The Helmers Mfg. Company, Leavenworth, Kan., has contracted for an engine-driven generator, motors, &c., with which to operate its plant by electric power.

The Southwestern Portland Cement Company, El Paso, Texas, is reported to have completed installation of a new power plant.

The Eldorado Water & Power Company, Eldorado, Texas, is planning to install an electric generating unit and other machinery.

The Westmoreland Supply Company, Houston, Texas, is considering the purchase of air lift pumps for deep well service at Rice, Texas.

The Black Range Works Company, Fairview, N. M., will take bids on a steam-driven power plant, electric hoists, air compressors, drills, 100-ton mill and cyanide plant and an aerial tramway system for its mines near Weber, N. M.

Machinery for a generating plant will be required this spring by the Huntsville Electric & Power Company, Huntsville, Texas.

U. P. Bower, Independence, Kan., is figuring on putting in a gas power plant of about 100 hp. in the Eagle Roller Mills, which are under his management.

The Pittsburg Water & Light Company, Pittsburg, Okla., has been incorporated for the purpose of furnishing water and light to accommodate the mines and washer plant of the McAlester-Edwards Coal Company and to furnish power to the city of Pittsburg. The company will erect a plant and dam about 1½ miles south of the city on an elevation where it will have a 40-ft. head of water. It is expected that the contract for this work will be closed about April 15. Electricity for lighting purposes will not be generated until later in the year.

The Oklahoma Steel, Iron & Wire Fabric Company, Enid, Okla., has broken ground for a factory building 125 x 300 ft.

The Tulsa Automobile Company, Tulsa, Okla., has filed articles of incorporation with a capital stock of $75,000. The promoters of the concern are M. A. Campbell and S. C. French, who have been operating an automobile factory at Dowagiac, Mich., for several years, which will be removed to Tulsa. The building to be occupied by the company will be 50 x 150 ft., two stories, and it is expected that it will be in operation by the middle of May. The company will manufacture commercial and sightseeing cars.

The Rullman-Rullman Mfg. Company, Wathena, Kan., manufacturer of washing machines, is preparing to remove its factory to St. Joseph, Mo., where it has purchased a tract of ground upon which a new factory will be erected.

The H. S. Busby Mfg. Company, Girard, Kan., is removing its factory to Washington, Iowa, and expects to be in operation at that place by April 1. Considerable new equipment has been installed at the new location, but it is understood that additional machinery will be purchased during the summer.

A correspondent in the Southwest writes that W. Lauder and others will construct a hydroelectric plant at Yoakum, Texas. Further particulars are lacking.

The Manufacturing Committee of the Chamber of Commerce of El Paso, Texas, has recommended that steps be taken to secure the establishment in that city of a 30-ton rolling mill, to be run in conjunction with the steel casting foundry now in operation there.

The Dumont-Holmes Steel Concrete Company, Chicago, has obtained a permit to do business in Texas. The City Council of Austin recently entered into a contract with this company to construct and maintain a dam across the Colorado River and a hydroelectric power plant, which will cost $1,000,000. It is to be paid for in 25 semiannual installments of $40,000 each. Before the contract can become effective it must be ratified by vote of the people of Austin. A special election will be held in April for this purpose.

The contract for installing a water works plant at Valentine, Texas, has been let to Thomas Dean of Alpine.

The Tips foundry at Austin, Texas, which was destroyed by fire several months ago, entailing a loss of more than $125,000, is erecting a large new brick building in which much of its machinery will be installed.

W. W. Thompson and associates, who recently obtained a franchise for the installation of an electric light plant at Belton, Texas, have ordered the machinery from Pittsburgh, Pa.

The Board of Commissioners of Nueces County has awarded the contract for the construction of a new steel

bridge across the Nueces River near Corpus Christi, to C. Q. Horton of Austin.

It is stated by Capt. A. B. Wolvin of Duluth, Minn., president of the Texas City Company, that is constructing extensive terminals and warehouses at the subport of Texas City, on the mainland opposite Galveston, that a great amount of labor saving machinery will be installed to lessen the cost of handling the freight. Overhead electric cranes will be placed in each of the warehouses and upon the docks electric cranes are also being installed. He says that the company is reversing the usual manner of handling freight, by placing the machinery upon the docks instead of using ship's tackle. Electric motors, using the third rail system, will handle the switching in the yards and upon the docks. The new powerhouse of the company will soon be finished.

The City Council of Little Rock, Ark., has appropriated $50,000 for the construction of an electric light plant. Particulars may be obtained from John Bleidt, city engineer.

An iron and brass foundry and machine shop will be constructed by Charles J. Stanzel, Schulenburg, Texas. A list of the necessary equipment has not yet been made up.

## The Central West.

OMAHA, NEB., March 26, 1910.

Representatives of a number of leading manufacturers east of the Mississippi River, who make Des Moines and Omaha their headquarters, report that within the past week or 10 days they have closed on estimates made as far back as the early part of January. A considerable percentage of the inquiries more recently received also developed into contracts, and all indications now point to another season of fairly steady buying. The warm weather prevailing lately has stimulated building operations of all kinds, and both the steam and electric railroads have hired as many men for track work, terminal improvements, &c., as the labor agencies can supply. Installation of new machinery in industrial plants is also being pushed, and in some cases contractors have been offered substantial bonuses to get work done ahead of the time specified in their agreements. All of this naturally tends to give a lively tone to the market, and the salesmen connected with the various manufacturing and supply houses have shaken off the lethargy which seems to have quite generally characterized their recent efforts. There is every likelihood that spring trade will be heavy and that the increased output of foundries, shops, mills and factories all through the Western States will in turn create a larger demand for equipment.

Contracts recently taken by Iowa fabricating plants include material which the Des Moines Bridge & Iron Works will furnish for three bridges made necessary by the Milk River irrigation system near Malta, Mont., and the building of a steel structure over the White Fox River near Webster City, Iowa, by the Ottumwa Bridge Company.

The city of Lincoln, Neb., whose requirements were mentioned some time ago, has purchased a Bullock engine-driven generating unit of 500-kw., with exciter dynamo and other apparatus. A cross compound Corliss engine will be the prime mover.

A machine shop and storage house 25 x 100 ft., two stories, will be completed this season at Clinton, Iowa, as a part of the M. S. Steel Lock Company's plant.

A machine shop equipped with modern tools is to be erected at Clinton, Iowa, by the Clinton Sugar Refining Company, with other buildings devoted to that industry.

An electric power plant for lighting and other service is to be installed by the municipal authorities at Allerton, Iowa.

Boilers, engine and dynamo, as well as other electrical equipment and accessory power plant apparatus, will be provided this season for the plant of the Louisiana Gas & Electric Company at Louisiana, Mo.

A vote will be taken at Fairbury, Neb., on the matter of purchasing the local power and pumping plant or building a new one.

Funds are being provided for the municipal power and lighting station planned by the authorities at Plainview, Neb., and a dynamo with accessory apparatus, including prime mover, the type of which has not yet been determined upon, will be purchased this spring.

Bids will be closed April 6 by the city of Madison, Neb., whose plans have been previously mentioned, for a motor-driven pump of 150 gal. per minute capacity, and a horizontal tubular steam boiler 72 in. x 16 ft. The motor required is for direct current, 15 hp., 250 volts.

The capacity of the municipal pumping plant at Alliance, Neb., will probably be enlarged this summer.

Boyes, Hulshizer & Co., Seward, Neb., will construct a hydro-electric plant at the site of the old dam on the Blue River.

The Sioux City Foundry & Mfg. Company, Sioux City, Iowa, is meeting with a good demand this season for its Norfolk furnaces, boiler and sheet iron work, &c., and some additional shop equipment is likely to be needed in the near future.

Woods Bros., Des Moines, Iowa, will increase their facilities during the year for the manufacture of traction engines and agricultural machinery, with an enlargement of the capital stock to $200,000.

A new factory is to be built at Des Moines by the National Seed Corn Tester Company. Plans, however, have not yet been prepared, and the machinery list is still to be worked out.

John G. Woodward & Co., Council Bluffs, Iowa, are preparing to put up a large addition to their factory. The new equipment will include four boilers and a variety of other apparatus. Machinery, elevators, &c., will be electrically operated.

Plans are being put in execution by Headford Bros. & Hitchens, Waterloo, Iowa, for another foundry unit, with cupola furnace, which will double the present capacity of the works. It includes a molding department 100 x 400 ft., a core room 50 x 50 ft., and a cupola space 50 x 50 ft. Handling apparatus and considerable pneumatic equipment will be among the requirements of the plant.

Some improvements will be made this year in the water works at Logan, Iowa.

Work on the development of the Keokuk & Hamilton Water Power Company, now under construction at Keokuk, Iowa, has advanced to the stage where the purchase of machinery will be considered shortly. It is proposed to install about 30 units, consisting of low head impulse turbines direct connected to dynamos.

Machinery is about to be purchased for the new packing plant which John Morrell & Co. will erect at Sioux Falls, S. D. A steam electric power plant of about 750 hp., with boilers, engines, generator, exciter, switchboard, motors, &c., will be among the requirements.

The new factory of the National Vacuum Heating Company, now under erection at Marshalltown, Iowa, will be fitted with the most modern machinery. The initial unit consists of three buildings, including power plant and office. Contracts for the greater part of the equipment have already been placed.

The Hannibal Electric Light & Railway Company, Hannibal, Mo., will be in the market this spring for an engine and dynamo of about 500 kw. capacity.

Construction of a municipal power and pumping plant, with steam or gasoline engine driven units, is being planned at Walthill, Neb.

Two horizontal tubular boilers and a number of pumps, motors, &c., will be required shortly by the Denver City Tramway Company, Denver, Colo., for a new building.

The Inter-Mountain Machinery Company has been organized at Salt Lake City, Utah, for the sale of equipment to mines, ore reduction plants and industrial works. Geo. V. Ballard, formerly of Lincoln, Neb., will be general manager.

The Vulcan Iron Works, Denver, Colo., is building a new type of rotary tunneling machine which has proved very successful in service.

Advices from Salt Lake City, Utah, state that the Griffin Wheel Company, Chicago, will build there one of the largest plants in the country for the manufacture of car wheels, a suitable site having been secured.

The Paxton-Mitchell Company, Omaha, Neb., has awarded a contract for the construction of a garage, 112 x 132 ft., which will be devoted exclusively to the repairing and storing of automobiles.

C. C. Gordon & Co., Dubuque, Iowa, have leased a building which they will equip for the repairing and rebuilding of automobiles.

The Denver Rock Drill & Machinery Company, Denver, Colo., has completed plans for the erection of a plant which will comprise shops, power house and a garage. When completed the company will employ about 350 men. Mining and excavating machinery will be manufactured.

## The Northwest.

ST. PAUL, MINN., March 26, 1910.

Improved traffic conditions in all parts of the Northwest, particularly for westbound freight, have given further stimulus to the machinery trade. Deliveries, and consequently collections, can now be made with reasonable promptness, enabling dealers to utilize more of their working capital for carrying stocks of standard tools, contractors' outfits, power sets, pumps and other apparatus. Every one buying equipment nowadays wants his stuff in a hurry, so that the manufacturer or dealer who can promise early shipment has decidedly the advantage in bidding for new business.

At the head of the lakes there is general anticipation of

the benefits to accrue from the building of the Minnesota Steel Company's plant near Duluth. It is stated that for these works fully 20,000 tons of structural steel will be required, together with an enormous quantity of other material; and the various subcontractors are certain to need construction equipment in considerable quantity. Hence local supply men are out for the business, and they do not intend to let much of it get away.

Some machine tools and other apparatus for repair work will be installed by the Wahpeton-Breckenridge Street Railway Company, Wahpeton, N. D., upon completion of its terminals. This is a new line and construction work will begin next month.

The Crookston Water Works, Power & Light Company, Huot, Minn., has started work on a new power plant to develop 3500 hp. The machinery needed is understood to have been partially provided for.

The Power Equipment Company, Minneapolis, has moved into much larger quarters at 210-18 Third avenue, North. Among the lines carried are Skinner automatic engines, Foos gasoline engines, Osgood scales, Sonander automatic scales, heaters, pumps, transmission machinery, jacks, pipe, valves, fittings, &c. In connection with the warehouse a well equipped machine shop has been provided. The company's trade throughout this section is now very large.

Among the orders which the National Iron Works, Duluth, has recently been engaged upon was the construction of a large hoist for the Duluth Dredge & Dock Company, delivered early in the month. Heavy work of this kind is no longer considered a rarity among the metal working plants of the State.

Among the busiest plants in this section are the Northwestern Foundry, Minneapolis, and the St. Paul Foundry Company, St. Paul, Minn. Both have recently filled large orders for structural material and the latter is also making a specialty of tanks and towers, as well as bridge work.

One of the largest stone cutting and finishing shops in the Northwest will be established by the Twin City Granite Works, recently organized at St. Paul, Minn., with a working capital of $100,000. A considerable line of operating machinery, including compressors and pneumatic appliances, with driving equipment, will be required a little later on.

The city officials of Austin, Minn., have intrusted a consulting engineer at St. Paul with the preparation of plans for a pumping station and water distribution system. Purchase of machinery will not need to be considered for some time.

The Consumers' Power Company, Stillwater, Minn., will install a belted generating unit of about 150 hp., to furnish electric power at Waterford, Minn.

Boilers and a gas producer plant for a combined lighting and heating system may be purchased this summer by H. E. Morton, Watertown, S. D., for installation at St. Peter, Minn., if a franchise is granted.

Koch & Son, St. Cloud, Minn., will build a new factory. Machinery requirements have not been announced, but equipment that has already been in service will probably be partially utilized.

The municipal authorities at Anoka, Minn., are planning a hydroelectric power development there. The project will, however, need to be ratified at the polls before any definite move is made.

From Glenullin, N. D., it is reported that the business of Waechter & Bean, which started with automobile repair work, has been developed to the point where it is necessary to install a regular machine shop for general service. The equipment needed has already been provided, but further expansion is likely in the near future.

J. G. Robertson, St. Paul, has been awarded the contract for installing a new boiler, engine, electrical generator and auxiliary apparatus at the municipal power plant in Grand Forks, N. D.

A modern woodworking plant will be established at Spokane, Wash., with equipment usual to such shops, by the White Pine Sash Company, recently organized there.

The Somers Lumber Company, Kalispell, Mont., has installed motors for handling its entire product by electric power and will be numbered among future buyers of such apparatus.

The W. V. Penoyer Company, recently organized at Penoyer, Idaho, is planning the construction of a timber mill, with modern equipment, at Orofino, Idaho.

In connection with its power extensions, the Northwestern Consolidated Milling Company, Minneapolis, Minn., will require considerable transmission machinery.

Negotiations are reported to be pending between the Minnesota Woodenware Company, whose factory at Foley, Minn., was burned, and the Commercial Club of Bemidji, Minn., for the rebuilding of the plant at that point instead of the previous location.

The Missouri Valley Engineering Company, Mitchell, S. D., has been intrusted with the preparation of plans for a hydroelectric generating plant of about 5000 kw., to be constructed by the Dakota Power Company, Rapid City, S. D. The current will be supplied chiefly to mines and ore reduction plants in the Black Hills.

The Cedar Rapids & Marion City Railway Company, Cedar Rapids, Iowa, is improving its power house by the installation of considerable new equipment which has all been purchased. Piping, valves and electric cable to be used in connection with these improvements has not been purchased as yet.

Another large line of motor-generator sets, single motors, &c., is about to be installed by the Watab Pulp & Paper Company at its mill near Sauk Rapids, Minn., which is one of the most complete electrically operated plants in the West, all machinery being motor-driven. Contracts covering the bulk of the new equipment have already been let.

## The Pacific Coast.

LOS ANGELES, CAL., March 24, 1910.

The activity noted in recent reports from the cities on the North Coast finds a parallel here, except that the character of the trade differs, being mainly concerned with the sale of machinery for outfitting mines, mills, smelters and oil developments. Hydraulic power and pumping units, steam or gas engine driven electric plants, transmission machinery, air compressors, blowers, hoists, crushers and construction layouts used for all purposes also sell to advantage; and the principal difficulty here, as elsewhere, is to secure deliveries promptly.

Among the manufacturers and dealers at Los Angeles doing a good business are the Union Iron Works, Fulton Engine Works, Harron, Rickard & McCone, Baker Iron Works, Union Tool Company, Llewellyn Iron Works, Calkins Company, Consolidated Pipe Company, J. F. Lucey Company, Koehler Tool Works, the Braun Corporation, Western Pipe & Steel Company, Pacific Tank Company, Southwestern Machinery & Supply Company, Kelman Electric & Mfg. Company, Western Gas Engine Company, Adams Pipe Works, R. Kelley Machinery Company, A. Cannady & Co., Commercial Engine Company, and local agencies of other Pacific Coast plants, and such Eastern concerns as the Westinghouse Machine Company, Westinghouse Electric & Mfg. Company, Denver Engineering Works Company, Fairbanks, Morse Mfg. Company, Goulds Mfg. Company, Allis-Chalmers Company, Deming Company, Western Electric Company and General Electric Company.

Local metal working shops have been buyers to a considerable extent lately of foundry and machine equipment of different kinds, but the bulk of the trade at present is in light tools, and some heavy ones, for repair work at isolated plants in the industries above referred to, as well as others scattered through lower California, Arizona and Nevada.

The Sweetland Filter Press Company, Los Angeles, has in the shop two filters of 150 tons each, which will be installed by the Providencia Mining & Milling Company, Guanajuato, Mexico. These are equipped with a hydraulic pressure arrangement for opening and closing rapidly, and each press has 30 frames.

The new steam turbine power plant of the Central Oakland Light & Power Company, Oakland, Cal., which is to be equipped with two Westinghouse Machine Company's units of 2000-kw. each, has reached the stage where machinery will soon be installed. The principal equipment has been purchased, but some subsidiary apparatus will be required later on.

A power plant of considerable capacity is to be built this spring at Needles, Cal., by the Needles Light & Power Co.

The Edison Electric Company, Los Angeles, has decided upon tentative plans for another power plant, to be located at Long Beach. Equipment details have not yet been considered.

A modern saw mill, with boilers, engine, driving equipment and cutting machinery will be built at Hoquiam, Wash., by the Eureka Cedar Lumber & Shingle Company.

A new phase of industry for the Northwest is foreshadowed in the action of the Pocatello Commercial Club, Pocatello, Idaho, which has recently been planning the erection of a textile plant there. Electric power, generated at low cost, will be available for such a factory.

Saws, planers, pneumatic tools, compressors, motors and an electric power plant will be needed for large cutting and finishing works to be constructed by the Washington Marble Company at Colville, Wash., if present plans are carried into effect.

The city of Newport, Wash., through its Commercial Club, will offer a substantial bonus for a new timber sawing and woodworking plant if one is erected there by outside capital.

Power and woodworking equipment will be required shortly for a new factory which the Yakima Sash & Door Company is planning to erect at North Yakima, Wash.

Power machinery, mixing machines, presses, &c., are reported to be needed in the near future for a brick manufactory to be installed by Field Bros. at Eugene, Ore.

The Jacobson-Bade Company, Portland, Ore., will proceed this spring with the construction of water works at

Central Point, Ore., contract for which was recently awarded them.

A cutting plant of moderate capacity is to be built at Sara, Wash., by Stone & Stewart. Boilers, engine, shafting and operating machinery will be needed.

A hydroelectric plant of 500 to 750 hp. will be built this year in the vicinity of Port Angeles, Wash., by the Port Angeles Electric Power Company. Current will be used for industrial purposes and lighting.

Schwager-Nettleton, Inc., Seattle, Wash., will build a large saw mill, the equipment of which is to consist of a steam turbine power plant of 750-kw. capacity, operating a line of alternating current motors, which will drive two 9-ft. double-cutting band mills, gang saws, resaw, edgers, automatic trimmer, slashers, sizers, surfacers, bolters and lath machines, as well as auxiliary apparatus.

Robt. M. Jones, Georgetown, Wash., will install an electric power and lighting plant.

The Superior Portland Cement Company, or affiliated interests, will build a hydroelectric plant intended to ultimately develop 25,000 hp. on the Baker River near Bellingham, Wash. Purchase of machinery will not be considered until the preliminary construction work has been completed; but high-head reaction turbines, with alternating current generators, will be among the requirements of the main power station.

The Twin City Light & Traction Company, Chehalis, Wash., will install machinery for a largely increased output.

N. W. Halsey & Co., San Francisco, Cal., have given out the following particulars of the organization of the Pacific Light & Power Corporation. It has been incorporated at $40,000,000 to take over the properties of the Pacific Light & Power Company, and the proceeds of the first $1,500,000 worth of preferred stock sold will be used for the construction of an electric generating plant at Redondo, having a capacity of 10,000 kw., transmission lines, distributing system, &c. Negotiations for steam turbines and other machinery are already in progress.

Two 4000-hp. turbine units and accessory apparatus will be installed by the Inland Empire Railway Company, Spokane, Wash., in its electric generating plant. Contract for the entire equipment has been awarded the Westinghouse Electric & Mfg. Company. This company will be a frequent buyer of machinery, including some tools for repair work, until after it has been in operation for some months.

The San Gabriel River Rock Company, Puento Largo, Cal., will install one or more large alternating current motors for machinery drive.

An electric plant to be operated by the city is under consideration by the municipal officials at Berkeley, Cal.

Experiments with a fume-controlling device, which is the invention of Prof. F. G. Cottrell of the State University, Berkeley, Cal., are being made at the Balaklala Copper Company's smelter, Kennett, Cal. If successful, it is likely to be widely used, as the problem sought to be solved is a very troublesome one in this part of the country and elsewhere.

The Portland Railway, Light & Power Company, Portland, Ore., has work under way and contemplated for the coming summer that will represent an expenditure of about $5,000,000. Improvements to be made will consist of track reconstruction and extensions, new equipment, new car barns, work on power plants and substations and new light and power installations.

The Northwestern Wheel & Wagon Company, Portland, Ore., recently incorporated and capitalized at $500,000, is having plans prepared for a main factory building 100 x 100 ft., a power house 32 x 60 ft., an office building 26 x 28 ft., and a warehouse to be erected this summer. The plant when completed will be equipped with modern machinery and will represent an investment of $50,000. The company is now negotiating for a site and will let contracts within a few days. A section wheel, the invention of C. L. Thompson, president of the company, will be manufactured.

The Columbia Wire & Iron Works, Portland, Ore., will move to its new office and shop at East Eighth and Market streets in that city, about May 15. The new shop will be equipped with the latest machinery for the manufacture of elevator equipment and ornamental wire enclosures, orders for which have been placed.

The Pacific Steelite Company, Inc., San Francisco, Cal., is erecting at that city a factory to be used as an oxidizing plant for making a nonexplosive ingredient to be used in the manufacture of steelite. The factory and equipment will represent an expenditure of about $10,000.

## The South.

ATLANTA, GA., March 28, 1910.

Through Georgia and the Carolinas the principal feature of the general machinery market at present is the demand for boilers, stokers, heaters, pumps, engines, turbine wheels, gas producer power plants, electric generators, motors and transmission machinery. Cheap power is the broad foundation upon which much of the rapidly growing importance of this section from a manufacturing standpoint now rests. Hydroelectric developments are playing a large part in the scheme of things, wherever water power can be utilized; but steam, gas or oil engines must still be installed in the majority of instances; and the units that show economy in the use of fuel, as well as low cost of maintenance and attendance in other respects, will almost invariably be given preference, except where the purchaser's funds are limited and he must take whatever he can get for the least money. For all units of more than moderate capacity, the market is still supplied chiefly by Northern builders; but a number of plants in centers of distribution like Birmingham, Atlanta and Chattanooga are now turning out power equipment equal to the best known types, and they seem to have all they can do to fill orders.

A foundry, boiler shop and machine shops, with electric power plant, will be built, it is reported, on a site recently acquired by the Georgia Southern & Florida Railway Company at Valdosta, Ga. All machinery is to be motor driven. Headquarters are at Macon, Ga.

Granbery Jackson, Nashville, Tenn., is consulting engineer for the pumping plant and extensive system of water works to be constructed at Henrietta, Okla. Among the machinery needs will be two gas engine driven pumps of 500 gal. per minute capacity each.

The remodeled plant of the New South Plow Works will not begin operations before Aug. 1. Meanwhile improved machinery designed for increased economy of production and better quality of output will be installed.

From Clarksville, Tenn., it is reported that the Red River Furnace Company has purchased the White Stone Quarry at Bowling Green, Ky., and will provide equipment for a much larger output. The product will be used both for building purposes and furnace flux. The quarry is one of the largest in that section and has furnished material for many important buildings in various cities of the State.

Boiler, pumps, engine, generator, motors and other machinery used about the plant will be required for equipping the remodeled buildings of the Lexington Street Brewery, Louisville, Ky. All of the details have not yet been worked out, but bids will be considered in the near future.

The Alabama Power Company, Montgomery, Ala., has started work on a hydroelectric development which is intended to aggregate 50,000 hp., power being obtained from the Coosa River. Turbines, generators, governors, exciter units, transformers, switchboard, &c., will be required as soon as the project is well along towards completion, and the plans call for five more similar generating stations, to be constructed later.

One or more new boilers are to be purchased shortly for the municipal plant at Athens, Ala.

From Albany, Ga., it is reported that a steam power plant will be erected by the Albany Power & Mfg. Company to operate in connection with its hydroelectric generating station during seasons of low head.

The Holston Mfg. Company, Lenoir, Tenn., will put up a new building and install some additional machinery.

A steel tank to hold 1,000,000 gal, may be installed by the city of Brookhaven, Miss., in connection with its water works station.

Additional turbines and generators for its electric station will be required by the Columbus Power Company, Columbus, Ga., upon completion of projected improvements, which include the construction of a new dam. This is one of the properties controlled by Stone & Webster Company, Boston, Mass., and any authoritative information must come from them.

Equipment will be required this spring by the Maddox Foundry & Machine Company, Archer, Fla., for additions to its pattern, machine and forge shops. Some contracts covering apparatus may have already been let, but the details can be obtained by direct inquiry.

The Stone-Electric Light & Power Compay, Wytheville, Va., will purchase an engine of about 50 to 60 hp., gasoline preferred.

The Loomis Utilization Company, Waycross, Ga., has placed orders with Northern builders for two 200 kw. engine driven generating units for direct current, with accessory machinery. Some further equipment will be needed later.

It is probable that an electric power plant for city use will be built before autumn at Donaldsonville, Ga. Authority for its construction has, however, not yet been given.

The Memphis Machine Works, Memphis, Tenn., has increased its capital stock to $40,000, with the object, it is reported, of extending the facilities of the plant.

Quarry equipment, including power machinery, compressor, drills, hoist, &c., will be provided by the Brownfield, Miller & Stewart Company, Bowling Green, Ky., for a new property which they are opening up there.

Some new apparatus is to be installed this season in connection with the electric generating system of the Jackson Railway, Light & Power Company, Jackson, Miss.

The Levisa Creek Coal, Coke & Power Company, Okla-

homa City, Okla., is contemplating the installation of a water power and electric light plant on its property on the waters of Levisa Creek, Buchanan County, at a cost of about $250,000.

The Louisville Lighting Company, F. M. Sackett, president, Louisville, Ky., will expend $150,000 for machinery, boilers and dynamos to be added to its plant.

Advices from Sparta, Tenn., state that work on the hydroelectric plant of the Anderson-Tubb Power Company, which was discontinued some time ago, has been resumed, and generating units will be installed this summer.

The William J. Oliver Mfg. Company, Knoxville, Tenn., is extending its gray iron foundry, and within the near future will put in a malleable furnace.

## Government Purchases.

WASHINGTON, D. C., March 29, 1910.

Capt. David L. Stone, constructing quartermaster, U. S. Army, Fort Sill, Okla., will open bids April 15 for an electric light and power plant at Fort Sill.

Capt. Malver-Hill Barnum, constructing quartermaster, U. S. Army, Fort Robinson, Neb., will open bids April 11 for boilers, pump, feed water purification system.

The Isthmian Canal Commission opened bids March 21 for the following:

Class 1.—One 7 x 10 in. engine—Bidder 1, American Hoist & Derrick Company, St. Paul, Minn., $995.20; 6, Charles Barnes Company, Cincinnati, Ohio, $995; 16, Exeter Machine Works, Pittston, Pa., $922; 18, Fox Brothers & Co., New York, $846.84; 24, Leneher Engineering Company, New York, $958; 25, Lidgerwood Mfg. Company, New York, $1011; 29, Mead, Morrison Mfg. Company, New York, $885; 39, Stroudsburg Engine Works, Stroudsburg, Pa., $856.75; 48, Williamson Brothers Company, Philadelphia, Pa., $950.

Class 3.—Two 12-in. discharge pumps—Bidder 8, Blackhall & Baldwin Company, New York, $6530 and $6150; 11, Camden Iron Works, Camden, N. J., $7764; 13, D'Olier Engineering Company, Philadelphia, Pa., $9582; 18, Fox Brothers & Co., New York, $3182.74; 28, Manning, Maxwell & Moore, New York, $7117, $7966, $8221 and $8308; 41, United Iron Works, Oakland, Cal., $13,374 and $12,574; 46, Watson, Stillman Company, New York, $6800; 58, Henry R. Worthington, New York, $6429 and $6682.

Class 4.—Two portable pumps, 3-in. discharge—Bidder 8, Blackhall & Baldwin Company, New York, $1170; 11, Camden Iron Works, Camden, N. J., $1054; 13, D'Olier Engineering Company, Philadelphia, Pa., $1296; 18, Fox Brothers & Co., New York, $1038.60; 28, Manning, Maxwell & Moore, New York, $967 and $1058; 41, United Iron Works, Oakland, Cal., $1146; 46, Watson, Stillman Company, New York, $1250; 58, H. R. Worthington, New York, $1264 and $1276.

The Bureau of Supplies and Accounts, Navy Department, Washington, opened bids March 22 for one 5000-lb. improved steam drop hammer; Bidder 31, Erie Foundry Company, Erie, Pa., $7400; 65, Morgan Engineering Company, Alliance, Ohio, $5985; 70, Manning, Maxwell & Moore, New York, $6320; 76, Niles-Bement-Pond Company, New York, $7990.

## The Chicago Branch, National Metal Trades Association.

The annual dinner and meeting of the Chicago Branch, National Metal Trades Association, took place at the Mid-Day Club, on the evening of March 22. Over 100 were present. After the dinner an address was made by President O'Leary, in which he emphasized the work accomplished in the development of the co-operative course for shop apprentices in conjunction with Lewis Institute, making formal announcement of the encouragement in this work received from LaVerne W. Noyes, president of the Aermotor Company, in his offer to pay the tuition at the institute of deserving boys who might enter this course up to the number of 200, or, in other words, up to $10,000 per annum. By a rising vote the thanks of the association were tendered to Mr. Noyes for this very substantial gift.

President O'Leary then spoke of the latest step in instituting insurance for employees under a special contract with the Phœnix Preferred Accident Insurance Company of Detroit, whereby the benefits to the men were increased from 40 to 100 per cent. over and above what it would be possible for them to receive as individual insurers. One special feature embodied in the plan is that of free medical service for both accident and sickness.

A plan was touched upon for more frequent meetings during the coming years. Secretary Blatchford's report showed that during the past year labor difficulties had been few and far between. In closing, the report called attention to a statement contained in a recent issue of the weekly *Bulletin* of the branch, in reference to the scarcity of employees, which states that the only solution of the condition seems to be bringing forward the handy men, placing in the shop all the apprentice boys who can economically be worked, and, by the instruction given by competent journeymen, combined with the supervision of foremen, develop them as rapidly as possible.

The election of officers for the ensuing year resulted as follows: President, John W. O'Leary, A. J. O'Leary & Son Company; vice-president, W. L. Kroeschell, Kroeschell Bros. Company; treasurer, L. C. Walker, Aermotor Company; secretary, Paul Blatchford, 1524 Tribune Building. Executive Committee: H. H. Latham, Latham Machinery Company; Frank S. North, Union Special Machine Company; Staunton B. Peck, Link-Belt Company; Louis E. Burr, Woods Motor Vehicle Company; A. T. Simonds, Simonds Mfg. Company; F. H. Blanding, Allis-Chalmers Company.

After the business session, the following addresses were delivered: "Co-operative Course for Shop Apprentices," by George N. Carman, director Lewis Institute; "Employees' Insurance," by L. O. Chatfield, president Phœnix Preferred Accident Insurance Company, Detroit; "Legislation—State and Federal," by Hon. William E. Mason. The meeting was not only one of the largest ever held by the branch, but one of the most interesting and successful.

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## Trade Publications.

**Chain Block.**—Ford Chain Block Company, 133 North Second street, Philadelphia, Pa. Circular. Relates to the Tribloc spur gear chain block, in which the gears, hooks, cross heads and pinions are of steel and the chains are all hand welded. The particular advantages claimed are compactness and great strength, easy working and long life.

**Combination Sheet and Pair Furnace.**—George J. Hagan, 401 People's Bank Building, Pittsburgh, Pa. Catalogue. Illustrations and descriptive matter explain the operation of the Bailey combination sheet and pair furnace, which was illustrated and described in *The Iron Age* February 17, 1910. These furnaces when equipped with an automatic stoker fed firebox effect a saving in the amount of fuel consumed of approximately 40 per cent. This is caused by the gases from the pair furnace passing into the sheet furnace and thence into the draft flues, thus dispensing with one firebox.

**Forge Shop Furnaces.**—W. S. Rockwell Company, 50 Church street, New York. Catalogue No. 8. Deals with the Rockwell forge shop furnaces for forging, flanging, plate heating, angle bending, spring fitting, case hardening, tempering and annealing. These furnaces are operated with oil or gas fuel and are made in a number of sizes for handling different classes of work.

**Bearings.**—Empire Metal Company, Syracuse, N. Y. Booklet. Illustrates and describes the Empire motor metal bearings for internal combustion engines. Discusses the different kinds of bushings and shows wherein the four styles of this company differ and are said to be superior.

**Industrial Railways for Construction Work.**—Ernst Wiener Company, 50 Church street, New York City. Booklet. Describes the construction of a concrete dam 600 ft. long across the Connecticut River at Bellows Falls, Vt., where Wiener industrial railways and cars were used. The booklet is a reprint of an article from *Concrete Engineering*. One of the illustrations shows the railway track laid on top of the centering for the dam.

**Centrifugal Pumping Machinery.**—Morris Machine Works, Baldwinsville, N. Y. Illustrated catalogue; size 6 x 9 in.; 96 pages. Treats of centrifugal pumps and engines for driving them. These pumps are built for a wide range of delivery pressures in both single and multiple stage types, horizontal and vertical models, for belt drive or direct connection to an electric motor. Simple and compound engines are dealt with in the latter part of the catalogue and a number of tables are appended.

**Power Presses.**—T. W. G. Cook, 2 Reade street, New York City. Circular. Lists a line of inclinable power presses made in three sizes, with beds ranging from 7 x 12 in. to 10 x 18 in. The special features of these presses are adjustment from the customary vertical position to a horizontal one or to any intermediate angle, and the location of the shaft back of the slide, which, it is claimed, gives a longer slide and furnishes a straighter guide for the punches and dies.

**Thermometers and Pyrometers.**—The Leeds & Northrup Company, 4901 Stenton avenue, Philadelphia, Pa. Catalogue. Calls attention to thermometers for measuring any temperatures from the lowest which may be produced up to 2200 degrees F. These thermometers depend upon the change in the electrical resistance of the metals used in their construction for their operation, and it is claimed that this method is superior to the ordinary thermocouple method. Three types of instrument are made: The balance type with resistance thermometer bulbs, the deflection type with either multiple or adjustable scales, and a recording model.

**Gas Engines.**—Weaver & Wittle, Lebanon, Pa. Circular. Contains a description of the Nanzy 1 and 2½ hp. gas engines of the four-cycle hit-and-miss type. Two of the special features of these engines are an adjustment of the speed screw of the governor while the engine is running and the absence of any packing to blow out, as all the joints are ground to a tight fit.

**Marine Gas Engines.**—Fairbanks, Morse & Co., Chicago, Ill. Two catalogues. No. 112B refers to a line of four-cycle heavy duty marine engines employing gasoline, petrol, kerosene, naphtha, distillate, solar oil, benzine or alcohol as fuel. This type of engine is made in four sizes from 20 to 100 hp. and was especially designed for merchant and passenger boats and cabin cruisers. No. 113 gives a general description and specifications of two types of a two-cycle marine engine having either one, two, three or four cylinders. The single cylinder model develops 3½ or 6 hp. The former type is made in the one and two-cylinder sizes only and has a maximum capacity of 7 hp., while the other three models of the latter type develop 12, 18 and 24 hp., respectively.

**Steam Indicator.**—Ashcroft Mfg. Company, 85 Liberty street, New York. Pamphlet. Deals with the Tabor indicator, which is made in a number of forms adapted for use on all kinds of steam and gas engines. Space is given to the parallel movement for the inside spring indicator and to the duplex spring arrangement found in the outside spring model. The Houghtaling reducing motion, the Ashcroft reducing wheel, the pantagraph, indicators with electrical attachments for taking a number of cards simultaneously, the Coffin averaging planimeter, and different indicator parts and supplies are illustrated and described.

**Spiral Pump.**—The Humphryes Mfg. Company, Mansfield, Ohio. Circular. Illustrates the Blazer patent spiral pump. Among the advantages claimed for this pump is that it requires no suction or discharge pipe, as the well casing performs this function and consequently there are no suction or discharge valves to be repaired or replaced.

**Mechanical Draft.**—B. F. Sturtevant Company, Hyde Park, Mass. Bulletin No. 75. Tells what mechanical draft is and what it does. The illustrations show installations of the Sturtevant mechanical draft appliances in plants in different parts of the country, and there is a brief statement under each illustration of the particular improvement effected by their use.

**Automatic Sewage Ejector.**—The Blaisdell Machinery Company, Bradford, Pa. Catalogue No. 50. Illustrations and descriptive matter explain the operation of an automatic sewage ejector for the removal of sewage, sewer liquids, kitchen drainage, laundry refuse and other liquid waste from below the sewer level. A list of installations is appended and the illustrations include some of the buildings where this device has been placed and typical installation diagrams.

**Cocks and Valves.**—The Roberts Brass Mfg. Company, Fort and Morrell streets, Detroit, Mich. Catalogue; size 4¼ x 6¼ in.; pages, 179. Describes a line of air, gauge, cylinder and gas stove cocks, needle and air valves, water gauges, compression bibbs and stops in red and yellow metal and gauge glasses, which it handles as jobbers. All the different models are illustrated and some hints on the proper use of water gauge glasses are appended.

**Sight Flow Indicator.**—Peterson Engineering Company, 50 Church street, New York. Bulletin No. 51. Calls attention to the Peterson sight flow indicator, which is a device designed for insertion in pipe lines to show at a glance or indicate electrically that liquid is flowing. One of the advantages claimed for the indicator is that it gives an accurate, positive indication without impeding the free passage of the liquid or gas through the pipe. An illustrated description of this device was printed in *The Iron Age* March 3, 1910.

**Flooring Machines.**—S. A. Woods Machine Company, Boston, Mass. Folder. Illustrates the No. 19 eight-roll and the No. 20 six-roll machines, both of which are equipped with a one-side drive. Attachments such as the new convertible disk side head, beading attachment, truing device, round cutter head, and radial knife setting gauge are also shown. An illustrated description of the No. 20 machine was printed in *The Iron Age* March 3, 1910.

**Blow-off Valve.**—Simplex Engineering Company, 1109 Locust street, Philadelphia, Pa. Bulletin No. 12,109, shows the Simplex seatless blow-off valve, which, it is stated, is so designed as to eliminate the trouble formerly experienced with leaky blow-off valves. When the valve is open there is a full, unrestricted area through the ports and in either position there is no seat or projection on which scale, grit or sediment can accumulate. A table of dimensions of the four sizes of valves is appended.

**Electric Fans.**—The Emerson Electric Mfg. Company, 2024 Washington avenue, St. Louis, Mo. No. 5400, the company's 1910 catalogue of alternating current fans. The models shown include stationary and oscillating fans for office and residence use, ceiling and column fans and exhaust fans. All of the ceiling fans are wired for lights independently of the fan motor circuit, so that it is not necessary to order a special model if it is desired to secure light and ventilation from the one outlet.

**Dumb Waiters.**—Lamson Consolidated Store Service Company, 161 Devonshire street, Boston, Mass. Bulletin No. 0-1. Pertains to a line of small hand and power operated elevators, dumb waiters and automatic conveyors for a number of different uses. The types illustrated range from a small ball cash lift for sending cash, jewelry or other small articles to a direct lift hydraulic elevator having a capacity of 400 lb.

**Rubber Belt Conveyors.**—The Jeffrey Mfg. Company, Columbus, Ohio. Booklet No. 35. Covers a line of conveyors and their accessories. The illustrations also include a number of installations for handling widely diversified materials. Among these are one for handling tailings at a South African gold mine, another for distributing crushed stone, a third for handling chips in a pulp mill, and two others for handling mail bags in the new Chicago post office and bottles in a canning factory, respectively.

**Punches and Shears.**—Wiener Machinery Company, Hudson Terminal Building, New York. Pamphlet. Concerned with the Eagle line of hand power punches and shears, which includes tools for all sizes and classes of work.

**Water Tube Boilers.**—The Milne Water Tube Boiler Company, 154 Nassau street, New York. Booklet. Contains the views of a number of installations of the Milne water tube boiler and illustrations and descriptive matter of interesting features of this boiler.

# CURRENT METAL PRICES.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report.

## IRON AND STEEL—

### Bar Iron from store—

Refined Iron:

| | |
|---|---|
| 1 to 1⅞ in. round and square | ₩ lb 1.90¢ |
| 1½ to 4 in. x ⅜ to 1 in. | ₩ lb 2.10¢ |
| 1½ to 4 in. x ¼ to 5-16 | |
| Rods—⅜ and 11-16 round and square | ₩ lb 2.10¢ |
| Angles: | Cts ₩ lb |
| 3 in. x ¼ in. and larger | 2.10¢ |
| 3 in. x 3-16 in. and ¼ in. | 2.35¢ |
| 1½ to 2½ in. x ¼ in. | 2.20¢ |
| 1½ to 2½ in. x 3-16 in. and thicker | 2.10¢ |
| 1 to 1¼ in. x 3-16 in. | 2.20¢ |
| 1 to 1¼ in. x ⅛ in. | 2.30¢ |
| ⅞ x ⅛ in. | 2.40¢ |
| ¾ x ⅛ in. | 2.50¢ |
| ⅝ x ⅛ in. | 3.55¢ |
| ½ x 3-32 in. | 4.35¢ |
| Tees: | |
| 1 in. | 2.65¢ |
| 1¼ in. | 2.45¢ |
| 1½ to 2½ x ¼ in. | 2.15¢ |
| 1½ to 2½ x 3-16 in. | 2.35¢ |
| 3 in. and larger | 2.15¢ |
| Beams | 2.10¢ |
| Channels, 3 in. and larger | 2.10¢ |
| Bands—1½ to 6 x 3-16 to No. 8 | 2.35¢ |
| "Burden's Best" Iron, base price | 3.15¢ |
| Burden's "H. B. & S." Iron, base price | 2.95¢ |
| Norway Bars | 3.60¢ |

### Merchant Steel from Store—

| | per lb |
|---|---|
| Bessemer Machinery | 1.90¢ |
| Toe Calk, Tire and Sleigh Shoe | 2.50@3.00¢ |
| Best Cast Steel, base price in small lots | 7¢ |

### Sheets from Store—

Black

| | One Pass, C.R Soft Steel. | R. G. Cleaned. |
|---|---|---|
| No. 16 | ₩ lb 2.90¢ | 3.00¢ |
| Nos. 18 to 21 | ₩ lb 2.95¢ | 3.10¢ |
| Nos. 22 and 24 | ₩ lb 3.05¢ | 3.20¢ |
| No. 26 | ₩ lb 3.10¢ | 3.30¢ |
| No. 28 | ₩ lb 3.20¢ | 3.50¢ |

### Russia, Planished, &c.

Genuine Russia, according to assortment, ₩ lb 12 @14½

Patent Planished, W. Dewees Wood. ₩ lb A, 10¢; B, 9¢ net

### Galvanized.

| | |
|---|---|
| Nos. 14 to 16 | ₩ lb, 3.20¢ |
| Nos. 22 to 24 | ₩ lb, 3.55¢ |
| No. 26 | ₩ lb, 3.75¢ |
| No. 28 | ₩ lb, 4.10¢ |

No. 20 and lighter 36 inches wide, 25¢ higher.

### Genuine Iron Sheets—Galvanized.

| | |
|---|---|
| Nos. 22 and 24 | lb ₩ .5.75¢ |
| No. 26 | ₩ lb .6.25¢ |
| No. 28 | ₩ lb .7.35¢ |

### Corrugated Roofing—

| 2½ in. corrugated. | Painted | Galvd. |
|---|---|---|
| No. 24 | ₩ 100 sq. ft. $3.85 | 4.80 |
| No. 26 | ₩ 100 sq. ft. 2.95 | 4.00 |
| No. 28 | ₩ 100 sq. ft. 2.60 | 3.75 |

### Tin Plates—

### American Charcoal Plates (per box.)

"A.A.A." Charcoal:

| | |
|---|---|
| IC, 14 x 20 | $6.35 |
| IX, 14 x 20 | 7.60 |
| A. Charcoal: | |
| IC, 14 x 20 | $5.40 |
| IX, 14 x 20 | 6.50 |

### American Coke Plates—Bessemer—

| | |
|---|---|
| IC, 14 x 20 107 lb | $4.40 |
| IX, 14 x 20 | 5.40 |

### American Terne Plates—

| | |
|---|---|
| IC, 20 x 28 with an 8 lb. coating | $8.50 |
| IX, 20 x 28 with an 8 lb. coating | 10.50 |

### Bolts—Carriage, Machine, &c.—

| | |
|---|---|
| Common Carriage (cut thread): | |
| ⅝ x 6 and smaller | 70&7½% |
| Larger and longer | 65&5% |
| Common Carriage (rolled thread): | |
| ⅝ x 6 smaller and shorter | 70&12½% |
| Phila. Eagle, $3.00 list | 80&5@80&10% |
| Bolt ends with C. & T. Nuts | 65&5% |
| Machine (Cut Tthread): | |
| ⅝ x 4 and smaller | 70+12½% |
| Larger and longer | 65&10% |

### Nuts

Blank or Tapped.

| | |
|---|---|
| Cold Punched: | Off list. |
| Square | 4.90¢ |
| Hexagon | 5.50¢ |
| Square, C. T. & R. | 5.30¢ |
| Hexagon, C., T. & R. | 6.10¢ |
| Hot Pressed: | Off list. |
| Square | 5.40¢ |
| Hexagon | 5.80¢ |

### Seamless Brass Tubes—

List November 13, 1908. Base price 18¢

### Brass Tubes, Iron Pipe Sizes—

List November 13, 1908. Base price 18¢

### Copper Tubes—

List November 13, 1908. Base price 22¢

### Brazed Brass Tubes—

List August 1, 1908. 20½¢ ₩ lb

### High Brass Rods—

List August 1, 1908. 15¼¢ ₩ lb

### Roll and Sheet Brass—

List August 1, 1908. 15¼¢ ₩ lb

### Brass Wire—

List August 1, 1908. 15¼¢ ₩ lb

### Copper Wire—

Base Price. Carload lots mill 15¼¢

## METALS—

### Tin—

Straits Pig ₩ lb 33¾@34¢

### Copper—

| | |
|---|---|
| Lake Ingot | ₩ lb 14¾@15 ¢ |
| Electrolytic | ₩ lb 14¾@15 ¢ |
| Casting | ₩ lb 14¼@14½¢ |

Sheet Copper Hot Rolled, 16 oz (quantity lots) ₩ lb 19 ¢

Sheet Copper Cold Rolled, 1¢ ₩ lb advance over Hot Rolled.

Sheet Copper Polished 20 in. wide and under, 1¢ ₩ square foot.

Sheet Copper Polished over 20 in. wide, 2¢ ₩ square foot.

Planished Copper, 1¢ ₩ square foot more than Polished.

### Spelter—

Western ₩ lb 6½@6¾¢

### Zinc.

No 9, base, casks ₩ lb 8¼¢ | Open ₩ lb 8¾¢

### Lead.

| | |
|---|---|
| American Pig | ₩ lb 5¼@5½¢ |
| Bar | ₩ lb 6¾@6½¢ |

### Solder.

| | |
|---|---|
| ½ & ½, guaranteed | ₩ lb 22½@22¾¢ |
| No. 1 | ₩ lb 18¾@19¼¢ |
| Refined | ₩ lb 17½@17¾¢ |

Prices of Solder indicated by private brand vary according to composition.

### Antimony—

Cookson ₩ lb ..@10¢

Hallett's .@10¢

Other Brands .@9½¢

### Bismuth—

Per lb $2.00@$2.25

### Aluminum—

No. 1 Aluminum (guaranteed over 99% pure), in ingots for remelting 4

Rods & Wire Base Price 31¢

Sheets Base Price 33¢

### Old Metals.

*Dealers' Purchasing Prices Paid in New York*

| | Cents |
|---|---|
| Copper, Heavy cut and crucible | ₩ lb 11.50@11.75 |
| Copper, Heavy and Wire | ₩ lb 11.00@11.25 |
| Copper, Light and Bottoms | ₩ lb 10.00@10.25 |
| Brass, Heavy | ₩ lb 7.75@ 8.00 |
| Brass, Light | ₩ lb 6.25@ 6.50 |
| Heavy Machine Composition | ₩ lb 10.25@10.50 |
| Clean Brass Turnings | ₩ lb 7.25@ 7.50 |
| Composition Turnings | ₩ lb 8.50@ 8.75 |
| Lead, Heavy | ₩ lb ....@ 3.75 |
| Lead, Tea | ₩ lb ....@ 3.50 |
| Zinc Scrap | ₩ lb ....@ 4.00 |


## THE IRON AGE

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